





NOTICE

- I. Dicotyledons—Polypetalous : Ranunculaceæ—Rosaceæ. Published September 10th, 1911.
- II. 1. Conspectus of the Flora of Formosa, Saxifrageæ—Dipsaceæ.
2. New or Noteworthy Plants of Formosa. Published October 15th, 1912.
- III. 1. Contributions to the Flora of Formosa, I. 2. On the systematic Position of *Mitrastemon*, as a Genus representing a special Tribus of the Raffleciaceæ. Published December 25th, 1913.
- IV. will be issued in September, 1914.

Readers will notice that the author have henceforth substituted the word "Volume" for "Fascicle" as used in the preceding portions of the *Icones Plantarum Formosanarum*.

ICONES PLANTARUM FORMOSANARUM
NEC NON ET
CONTRIBUTIONES AD FLORAM
FORMOSANAM.

III.

AUCTORE

B. Hayata.

3834

**TO HIS EXCELLENCY COUNT SAMATA SAKUMA,
GOVERNOR GENERAL OF FORMOSA.**

Sir,

I have the honour to submit to your Excellency the third volume of the “Icones Plantarum Formosanarum, nec non et Contributiones ad Floram Formosanam” by B. HAYATA, D. Sc.

KAKICHI UCHIDA,

CIVIL GOVERNOR OF FORMOSA.

April 1, 1913, Taihoku.

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INTRODUCTION

In the first and second fascicles of this work, I treated all Formosan plants belonging to families from the Ranunculaceæ to the Dipsaceæ, and it was my desire to treat the remaining families in the present volume so as to complete the flora in the rather compact form of a conspectus. But the new materials with which I have been loaded down since last year, and especially the collections made by myself in my two excursions to the island (in 1912) are so numerous that it has required my whole time to work up even the first part of them, and this has compelled me to put off, for some years, the continuation of the conspectus appearing in the preceding fascicles. The present volume is, therefore, almost wholly devoted to the results of a study of the materials which have been worked up since last year, and the results are here given under the heading, "Contributions to the Flora of Formosa I." All the species are here arranged, as in the preceding volumes, after the system of BENTHAM and HOOKER.

The collections above referred to are really considerable, and it will apparently take my whole time for nearly two years more to work them up thoroughly. Consequently it is probable that two more volumes will be required to present the results of investigations of the materials which are now on my hands. The conspectus mentioned above will, therefore, I trust, be continued by 1915.

In the course of my studies since last year, I have found many new species to be added to the flora of Formosa. Among them, the following genera* are new to our flora.

Captis, represented by *C. Morii* HAYATA which is related to a Japanese species, *C. quenquifolia* MIQ.

Macleya, represented by *M. cordata* R. BR. which is widely distributed through China and Japan, but is rather rare in this island.

Eudrema, represented by *E. hederifolia* F. et S. which is peculiar to Japan and Formosa.

Cascaria, represented by *C. Merrillii* HAYATA, which is related to some Philippine species. The genus is mentioned under the Samydaceæ in BENTHAM and HOOKER's fundamental work.** In my opinion, however, it should be referred to the Bixineæ, so far as the present plant is concerned, after the limitation of the two families (Samydaceæ and Bixineæ) mentioned in the same work. The genus is referred to the Flacourtiaceæ § Casearieæ*** in ENGLER's system.

Salomonia, represented by *S. stricta* S. et Z. which exists only in Japan and Formosa.

Melandrium, represented by *M. morrisonmontanum* HAYATA and two other species, all endemic to the island.

Arenaria, represented by *A. petiolata* HAYATA which closely resembles *A. serpyllifolia* LINN.

Ryssopteris, represented by a Philippine species, *R. Cumingiana* A Juss.

Chisocheton, represented by *Ch. kusakurensis* HAYATA which is closely related to *Ch. hongkongense* TUTCHER.

Cussine, represented by *C. illiciifolia* HAYATA and two other species, all endemic to Formosa.

Pygeum, represented by a Philippine species, *P. Preslii* MERR.

Sanguisorba, represented by *S. formosana* HAYATA, which is very near to *S. officinale* LINN.

Osteomeles, represented by *O. onthyllidifolia* LINDL. The species is distributed in Japan, the Bonin, Sandwich, Maingaia, and Pitcairn Islands.

* It should be understood that I have not counted in these genera any genus outside of Formosa, though they are mentioned in this work.

** BENTHAM et HOOKER, Genera Plantarum I. p. 731.

*** ENGLER, A. u. GILG, E., Syllabus der Pflanzentfamilien (1912) p. 268.

Ceriops, represented by a variety of *C. Cundolleana* ARN. The type is a native of the tropical shores of the Old World.

Monotropa, represented by *M. uniflora* LINN. The species is widely distributed in Northern India, Central China, Manchuria, Japan and North America.

Stimpsonia, represented by a *S. chamaedryoides* WRIGHT which is distributed in China, Korea and the Liu-Kiu Islands.

Geniostoma. A doubtful species of the genus is known from Kwa-shōtō Island.

Fagraea, represented by *F. Sasakii* HAYATA, which somewhat resembles *F. obovata* WALL.

Carpinus, represented by *C. Kawakamii* HAYATA and one other species, all endemic to Formosa.

Corylus, represented by a sterile specimen, closely related to *C. rostrata* var. *Sieboldiana* MAX.

Galeola, represented by a Malay plant, *G. altissima*.

Pinanga, represented by *P. Tashiroi* HAYATA which is closely related to a Philippine species, *P. Barnesii* BECC.

The species and varieties recently added or now to be added number as many as 211.*

Thus up to the present date, the total number of the flora, so far as is known, is 2918 species belonging to 881 genera and 158 families.

In the present volume, *Mitrapetrum Kawasasakii* HAYATA is mentioned under a family different from that to which it was formerly referred. As so great an alteration is a matter of importance, I have given my reasons under a separate heading, "On the systematic Position of *Mitrapetrum*, as a Genus representing a special Tribus of the Rafflesiaceæ."

Though the scope of the present work is limited to the study of the Formosan flora, I have included some collections from

* It should be understood that plants outside of the island are not counted in this number.

Hainan, Liu-Kiu, and the Bonin Islands, as I consider them to be regions closely related botanically to Formosa.

My readers will notice that I have substituted the word "Volume" for "Fascicle" as used in the preceding portions of the *Icones Plantarum Formosanarum, nec non et Contributiones ad Floram Formosanam*. As each of these portions contains more than two hundred pages and thirty plates, the word "Volume" seems more appropriate than "Fascicle."

In conclusion, I avail myself of this opportunity to tender my hearty thanks to the officials of the government of Formosa, to whom I am much indebted for help in the collection of materials and in the publication of this work.

B. HAYATA.

March 31, 1913, Taihoku and Tōkyō.

Contributions to the Flora of Formosa

I.

Ranunculaceæ.

Clematis LINN.

Clematis alsomitrifolia HAYATA sp. nov. Volubilis; caulis teres leviter 15-16 sulcatus, internodiis 7 cm. longis, ramis angulo 90° divaricatis. Folia opposita bitemnata, in circumscriptione rotundata vel oblonga, circ. 10 cm. in diametro, segmentis 9 oblongo-ovatis 4 cm. longis 2 cm. latis apice acutis vel breve acuminatis basi rotundatis vel rotundato-cordatis tenuiter coriaceis vel chartaceis 3- vel 5-nerviis, nervis basilaribus tenuissimis, nervis et venis utraque pagine elevatis, petiolis communibus 2 cm. longis vel longioribus, petiolulis ultimis 1- $\frac{1}{2}$ cm. longis. Flores paniculati, paniculis 10-15 cm. longis, terminalibus vel axillaribus, ramosis, ramis divaricatis angulo 90° divaricatis, ramis oppositis, bracteis cuspidatis. Flores maturi non visi. Sepala 4, extus hirsuta margine dense hirsuto-marginata, intus glabra, filamentis glabris, antheris elongatis apiculatis.

HAB. Formosa: Loco non indicato, leg. U. Mori, 1912, Ang.

Near *Cl. ovatifolia* Ito, but differs from it by the bitemnate leaves and the leaflets with a roundly cordate base, and also in having much smaller flowers.

Clematis angustifolia HAYATA n.n.

Clematis Leschenaultiana DC. var. *angustifolia* HAYATA Materials for a Flora of Formosa p. 16.

Clematis dolichosepala HAYATA sp. nov. Scandens; caulis glaber, tenuiter sulcatus, internodiis 12-13 cm. longis. Folia simplicia vel 3-foliolata, petiolis in longitudine variabiliis 2-7 cm. longis, foliolis in magnitudine variabiliis 4-8 cm. longis ovato-triangularibus apice obtusis ad apicem brevissime apiculatis basi truncato-rotundatis ad extremitatem acutis ad

petiolum abeuntibus utrinque glabris membranaceo-chartaceis margine integris 3-nerviis, nervis supra impressis subtus tenuissime elevatis apice convergentibus ad summum laminarum attingentibus, interdum præterea nervis basilaribus tenuissimis 2 additis. Flores axillares solitarii longe pedunculati, pedunculis 10 cm. longis supra basin bracteis oppositis instructis, bracteis oblanceolatis 1-2 em. longis apice apiculatis basi attenuatis. Sepala 5, lanceolato-oblonga, $3\frac{1}{2}$ em. longa, $1\frac{1}{3}$ em. lata, apice rotundata, ad summum obtuso-apiculata, basi sensim angustata, 3 mm. lata, 7-nervia, extus brevissime denseque hirsuta, intus glabra. Stamina ∞ , $1\frac{1}{2}$ em. longa, filamentis glabris, antheris linearibus 5 mm. longis apice apiculatis. Carpella ∞ , stylo longe sericeo-barbato.

HAB. Hieranza, leg. S. SASAKI, Feb. 1910, (Fl.).

Near *C. akiensis* HAYATA, but differs from it by the much longer sepals and ovately triangular leaves.

Clematis Henryi OLIV. var. **leptophylla** HAYATA n. v. Scandens, caulis glaber, tenuiter sulcatus, fuscо-rubescens. Folia opposita membranacea, simplicia, ovato-lanceolata, in magnitudine variabillima medioreria 15 em. longa, 5 cm. lata, apice acuminata vel acuminatissima, basi latissima, rotundata rotundato-truncata vel cordata, margine deorsum integra, sursum remote serrata romote mucronato-serrulata vel subintegra, triuervia, præterea 2 tenuissimis nervis addita, utraque glabra, petiolis longis laminam $\frac{1}{2}$ plo in longitudine æquantibus. Flores axillares solitarii vel gemini, pedunculis 3-5 cm. longis interdum deorsum 2-3-nodosis, ad nodos breve bracteatis, (bracteis oppositis triangulari-lanceolatis hirsutis 2 mm. longis), apice dilatatis. Flores non patentes, semiclausi, vel campanulati, 2 cm. longi, totiusque lati. Sepala 4, ovato-triangularia, 2 cm. longa, 11 mm. lata, apice acuta, margine plicata, partibus plicatis 2 mm. latis, extus brevissime hirsuta, intus glabra sed sursum leviter brevissime hirsuta, basi rotundata- vel rotundato-cordata, basi 2 mm. lata. Stamina ∞ , 3-seriata, $1\frac{1}{2}$ em. longa, filamentis complanatis, $\frac{2}{3}$ mm. latis, 1-nervatis, margine longe sericeo-barbatis barbis 3-4 mm. longis, antheris oblongis $2\frac{1}{2}$ mm. longis 1 mm. latis apice obtuse acutis. Carpella ∞ , 1 em. longa sericeo-barbata. Achænia complanato-oblonga facie hirsuta basi

breve rostrato-acuta, apice attenuata ad stylum abeuntia, $3\frac{1}{2}$ mm. longa $1\frac{1}{2}$ mm. lata.

HAB. Arisan, leg. B. HAYATA et S. SASAKI, Jan. 1912.

Differs from the type by the much thinner and less serrate leaves.

Clematis insulari-alpina HAYATA sp. nov. (Fig. 1.) Scandens, caulis glaber tenuissime pluri-sulcatus, internodiis 7 cm. longis, foliis et floribus

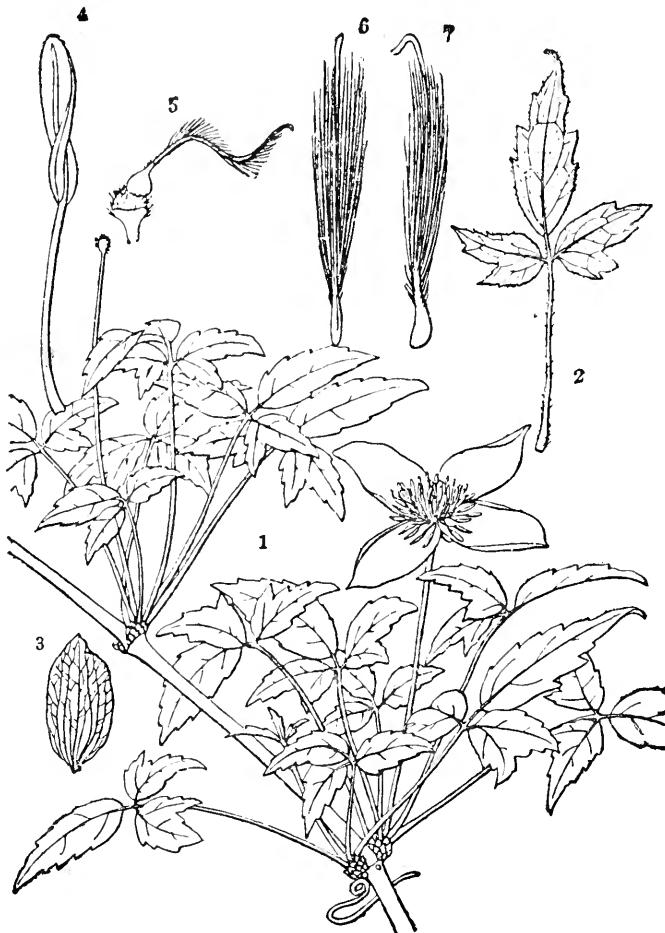


Fig. 1.

Clematis insulari-alpina HAYATA. 1, the plant; 2, a leaf; 3, a sepal; 4, a stamen; 5, a carpel on the receptacle; 6, 7, carpels. Fig. 1, 2 and 3 $\times \frac{7}{3}$; fig. 4, 5, and 7 more or less magnified.

ad nodos fasciculatis vel ad basin ramorum fasciculatis. Folia ad nodos caulis (vel basin ramorum et florum) fasciculata, trifoliolata, triangularia in circumscriptione, communibus petiolis $3\frac{1}{2}$ em. longis hirsutis basi leviter dilatatis intus late sileatis, foliolis lateralibus sessilibus vel breve petiolulatis, foliolis terminalibus petiolulatis, petiolulis 5 mm. longis; lamina folioli terminalis ovato-lanceolata, $3\frac{1}{2}$ em. longa $1\frac{1}{2}$ em. lata, apice acuminata, basi cuneata, tenuiter 3-lobata, vel inciso-serrata, utraque hirsuta. Flores ad nodos caulis fasciculati, (sæpe 1-5) longe pedunculati, pedunculis $7\frac{1}{2}$ em. longis, tenuiter sileatis hirsutis. Sepala 4, oblonga, apice obtusa ad summum breve euspidato-apiculata, basi contracta, 28 mm. longa, 13 mm. lata, basi 2 mm. lata, extus hirsuta intus glabra 7-nervia, patentia. Stamina ∞ , 10-8 mm. longa, antheris linearibus, $3\frac{1}{2}$ mm. longis $\frac{3}{5}$ mm. latis, apice rotundato-obtusis, basi obtusis. Carpella ∞ , stylo longe albo-sericeo-barbato, stigmate semi-clavato.

HAB. Montibus Formosae, leg. U. MORI, Juli. 1912.

Near *C. Pierotii* Miq., but differs by the broader sepals and much more hirsute leaves.

Thalictrum LINN.

Thalictrum micrandrum HAYATA sp. nov. (Tab. I.) Herba cæspitosa, radicibus interdum tuberiferis, tumoribus clavatis $1\frac{1}{2}$ em. longis, interdum non tuberiferis. Caulis cæspitosus gracillimus 30 em. altus pauciramosus, sub ramis 1-foliatus. Folia radicalia cum petiolis 25 em. longa, (petiolis 18 em. longis) late reniformia in circumscriptione, tri-ternatim pinnata, pinna terminali cum iis lateralibus conformi et aequilonga, pinnulis ultinis petiolulatis, petiolulis cum laminis aequilongis, angulo recto divaricatis; laminis obovato-cuneatis late rhomboideis vel late cordatis, variabilibus in magnitudine, 1-2 em. longis, margine deorsum integris sursum leviter 5-lobatis, margine desuper tenuissime recurvis, 3-5-nerviis, nervis et venis supra tenuissime, subtus prominente elevatis; petiolis communibus supra sileatis basi dilatatis, stipulis intrapetiolaribus cum petiolis connatis tenuissimis nigricantibus 3 mm. longis margine et apice erosionis. Folia caulinata biternata, (petiolis communibus 1 em. longis vel interdum 0) triangularia in circum-

scriptione 6 cm. longa totiusque lata, laminis pinnularum ultimaru m obovato-cuneiformibus, 1-2 cm. longis, versus apicem 3-lobatis. Flores ad apicem ramorum solitarii. Sepala 4, obovata, 3 mm. longa, 2 mm. lata, apice truncata, basi contracta $\frac{1}{3}$ mm. lata, valde concava, 3-nervia, interdum 2 nervis tenuissimis, addita, nervis lateralibus sursum fureatis. Stamina ∞ , brevissima, 1 $\frac{1}{2}$ mm. longa, filamentis 1 mm. longis apice clavatis linearibus antheram in longitudine 2-plo aequantibus, antheris late oblongis $\frac{2}{3}$ mm. longis. Carpella fusiformia stipitata, 1 $\frac{1}{2}$ mm. longa. Achenia recta, fusiformia longe stipitata, cum stipitibus 4 $\frac{1}{2}$ -5 mm. longa (stipitibus 1 $\frac{1}{3}$ mm. longis), prominente 4-costata, inter costas 1-eostulata.

HAB. Kinkwaseki, leg. Y. SHIMADA, 1912, Mai.

Near *T. Fauriei*, but differs from it by the much narrower and shorter filaments of the stamens and much larger form of the plant.

Thalictrum Morii HAYATA sp. nov. Caulis solitarius vel pauci-(1-2) fasciculatus, 15 cm. altus, glaberrimus, subteres sursum 1-2-ramosus, sursum 1-foliatus. Folia radicalia 2-3-4, cum petiolis 10 cm. longa, 2-plo vel 3-plo ternatim pinnata, excepto petiolo 4 cm. longa totiusque lata triangulata in circumscriptione, pinnulis ultimis cuneato-obtriangularibus circ. 1 cm. longis sursum trilobatis, (lobis obtusis rursus 3-lobulatis) obscurè trinerviis, venis laxe reticulatis, nervis et venis utraque pagina elevatis, subtus marginatis, membranaceo-chartaceis, petiolis communibus 6 cm. longis supra \pm suleatis basi dilatatis, stipulis tenuissimis membranaceis adnatis intrapetiolariis apice integris. Folia caulinia sessilia, 3-foliolata, petiolulis 6 mm. longis, foliolis cuneato-ovatis rursus 3-lobatis 1 cm. longis. Flores ad ramos terminales. Sepala obovato-oblonga, 5 mm. longa, 2 mm. lata, apice truncato-obtusa, basi \pm angustata, ad insertionem $\frac{1}{3}$ mm. lata, trinervia. Stamina ∞ , filamentis apice clavato-dilatatis, antheris elongato-ellipticis apice truncato-emarginatis basi lobato-emarginatis $\frac{2}{3}$ mm. longis. Carpella ∞ fusiformia, \pm obliqua, stipitata, stylo brevi apice complete recurvo stigmatoso.

HAB. Tonkwankei, leg. U. Mori, Aprili. 1910.

Near *T. Fauriei* HAYATA, but differs by the longer anthers and cuneately based leaves.

Thalictrum sessile HAYATA sp. nov. (Fig. 2.) Herba 60 cm. alta, caulis glaber in exsiccato pluri-sulcatus supra medium fureatim ramosus. Folia radicalia non visa, caulinata rotundato-triangularia, 15 cm. longa, (petiolis communibus 4 cm. longis, basi dilatatis caulem semiamplexantibus), ternatim pinnata, pinnis lateralibus 8 cm. longis rursus pinnatis, pinnulis ultimis obovato-rotundatis 22 mm. longis totiusque latis apice 5-lobatis basi late cuneatis, lobis oblongis apice rotundatis, mediis majoribus, subtus pallidioribus, pinnulis lateralibus minoribus obliquis oppositis petiolulis ultimis latelaribus 5 mm. longis, iis terminalibus 15 mm. longis. Flores versus apicem ramorum cymose laxe dispositi, pedicellis ultimis 1 cm. longis. Flores apertentes non visi. Receptaculum fructiferum clavato-globosum $\frac{1}{3}$ mm. in diametro. Staminae filaments apice \pm dilatata, claviformia, antheris oblongis $\frac{2}{3}$ mm. longis $\frac{1}{3}$ mm. latis apice apiculatis. Carpella matura sessilia ellipsoidea, fusiformia, \pm complanata, 8-costata, 3 mm. longa, 1 mm. lata, basi contracta, apice subito attenuata, ad stylum persistentem apice recurvum $1\frac{1}{2}$ mm. longum abeuntia.

HAB. Mt. Morrison, leg. U. MORI, Dec. 1909; Tōhozan, leg. S. SASAKI, Oct. 1909.

Near *T. actæfolium* S. et Z., but differs from it in having deeply lobed leaflets with acute or truncate lobes but not obovate ones as is the case with the congener.

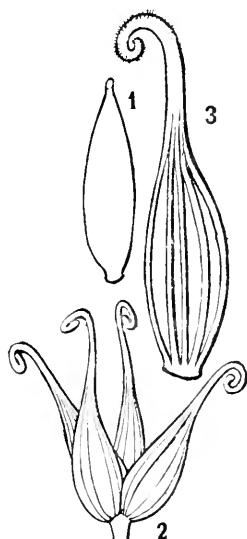


Fig. 2.

Thalictrum sessile HAYATA.
1, a premature carpel; 2, mature carpels; 3, one of the same.
All figures magnified.

Anemone LINN.

Anemone stolonifera MAXIM. Mél. Biol. IX. p. 605; MATSUM. Ind. Pl. Jap. II.-2, p. 105; NAKAI Fl. Koreana II. p. 429.

HAB. Montibus centralibus, leg. U. MORI, 1912.

DISTRIB. Mountains of Japan; Corea: Quelpaert.

Ranunculus LINN.***Ranunculus cheiophyllus*** HAYATA n. n.

Ranunculus Kawakamii HAYATA Mater. Fl. Formos. p. 19; Ic. Pl. Formos. I. p. 27, t. 6, (non MAKINO).

As the name *R. Kawakamii* had already been given to a Japanese plant, it is much desirable to give to the Formosan plant another new name, *R. cheiophyllus*.

Ranunculus geraniifolius HAYATA sp. nov. Radices fibrosæ ± tuberoso-inerassatæ; caulis basi repens ad nodos radices non emittens, patento-hirsutus 20 cm. longus, sursum erectus, partibus erectis 10 cm. longis 1-2-ramosis. Folia radicalia cum petiolis 7 cm. longa, lamina late triangularia in circumscriptione, 28 mm. lata 17 mm. longa, herbacea, basi late cordata, alte 3-lobata vel 3-fida, lobo terminali cuneiformi 1½ cm. longo 9 mm. lato apice 3-lobato, (lobis oblongo-triangularibus apice acutis), lobis lateralibus oblique cuneiformibus obliquis latere superiore lobo 1, latere inferiori lobis 2 instructis, (lobis triangulari-acutis), sinibus inter lobos obtusis; lamina trinervia, nervis 60°-90° a se egressis, utraque pagee patento-hirsuta, pilis fulvescentibus, petiolis 5-6 cm. longis hirsutis intus late et tenuiter sulcatis basi dilatatis vaginatis basi amplexicaulibus vaginis latere uno fisis 1 cm. longis in explicatio 4 mm. latis trinerviis extus patento-hirsutis intus glabris. Flores terminales vel solitarii longe pedunculati, pedunculis gracillimis 5 cm. longis patento-hirsutis. Flores apertentes non visi; torus fructifer oblongo-clavatus, 3 mm. longus 1½ mm. latus. Achænia semi-rotundata 1½ mm. longa, basi obliqua acuta, apice rotundata, complanata, dorso ventralique tenuissime costata, facie lævia sub microscopio minute obscuraque punctata.

HAB. Mt. Morrison, 11000 ped. alt., leg. S. SASAKI, 1908.

Ranunculus leiocladus HAYATA sp. nov. (Fig. 3.) Radices ± incrassatæ; caulis 2-3-cæspitosus, 25 cm. longus. Folia fere omnia radicalia longe petiolata, petiolis 10 cm. longis basi dilatatis, (partibus dilatatis ovatis 5 mm. longis 3 mm. latis), lamina simpliei (vel tripartita), late semi-rotundata 2½ cm.

longa 3 cm. lata 3-lobata vel tenuiter 5-7-lobata, apice obtusa, basi truncata vel truncato-cordata, ad extremitatem subito acuta ad petiolum abeunti, 3-vel 5-nervia lobo terminali 8 mm. longo 11 mm. lato; si lamina tripartita, triangulari in circumscriptione, $2\frac{1}{2}$ cm. longa $3\frac{1}{2}$ cm. lata, segmento terminali obovato-cuneiformi $2\frac{1}{2}$ cm. longo 9 mm. lato basi subito cuneato-attenuato, ad petiolulum 5 mm. longum attenuato, segmentis lateralibus cuneiformibus obliquis 2 cm. longis 1 cm. latis segmento terminali conformibus tenuissime 5-lobatis, lobis triangularibus obtusis glabris. Caulis usque ad medium non ramosus aphyllus sursum pauci-ramosus, sub ramis foliis 1 instructus, foliis caulinis vel bracteis

sessilibus 3-fidis, segmentis divaricatis linear-lanceolatis $1\frac{1}{2}$ cm. longis. Flores laxissime cymosi vel solitarii axillares vel terminales longe pedunculati, pedunculis 2-3 cm. longis, bracteis interdum trifidis vel interdum simplicibus lanceolatis 1 cm. longis. Sepala 5, oblonga 4 mm. longa, utrinque obtusa, 2 mm. lata, intus glabra, extus hirsuta. Petala 5, obovato-oblonga, 1 cm. longa 4 mm. lata, apice rotundata, basi obtusa, contracta, vel unguiculato-contracta, intus basi sacculo minuto uno instructa. Stamina ∞ , $2\frac{1}{2}$ mm. longa, antheris linearibus exteriore leviter recurvis. Achænia matura non visa.



Fig. 3.

Ranunculus leiocladus HAYATA. 1, a leaf; 2, a flower; 3, a sepal; 4, a petal; 5, 6, stamens; 7, a symcarp. Fig. 1, natural size; others magnified.

HAB. Tōyen: Chūreki, leg. Y. SHIMADA, 1909, Mart., Fl.

Near *R. ternatus*, but differs in having oblong petals and hirsute sepals.

Ranunculus sceleratus LINN.; MATSUM. et HAYATA, Enum. Fl. Formos. p. 8.

HAB. Kelung, leg. S. SASAKI, 1910, Aprili.

Ranunculus Sieboldi Miq. in Ann. Mus. Bot. Lugd. Bat. III. p. 5.

HAB. Nagodake, Loo-choo, 1907, Aprili. leg. G. NAKAHARA.

DISTRIB. Loo-choo; Shanghai?

Coptis SALISB.

Coptis Morii HAYATA sp. nov. (Tab. II.) Herba perennis, rhizoma ignotum. Folia omnia radicalia longe petiolata, lamina chartacea palmatim 5-foliolata, (foliolis sessilibus), in ambitu late pentagona $5\frac{1}{2}$ cm. longa 6 cm. lata, foliolo terminali rhombeo-cuneato $3\frac{1}{2}$ cm. longo 2 cm. lato apice triangulare-acuto basi cuneato-acuto inciso-3-lobato, lobis approximatis, lobo terminali cuneato-obovato 16 mm. longo 11 mm. lato inciso-3-lobato, lobis serratis, serris aristatis; foliolis lateralibus cum eo terminali conformibus sed \pm minoribus, iis basilaribus valde obliquis inciso-2-lobatis, lobis inciso-3-lobulatis, lobulis inciso-serratis, foliolis omnibus margine medio sursum serratis, serris 2-3 mm. longis acutis ad apicem aristis 1 mm. longis instructis, medio deorsum integris; foliolis omnibus 3-nerviis, nervo centrali valido, iis lateralibus tenuibus, omnibus supra prominente distinetque elevatis, venulis elevatis, grosse elevato-reticulatis, ad nervos et venas sub lente minute pubescentibus, subtus omnibus planis indistinctis, pagine supra viridibus, subtus pallidissimis glabris, petiolis 13 cm. longis gracilibus glabris, stipulis evanescentibus, reliquis fibrosis. Seapi erecti exserti, elongati, graciles, aphylli, glabi, 28 cm. longi, 1-2 mm. in diametro sectionis simplices vel pauci-ramosí, bracteis basi pedunculorum linearibus 3 mm. longis, ad basin pedunculorum adnatis, pedunculis 5-6 cm. longis. Flores terminales, plerumque solitarii, apertientes 18 mm. in diametro. Sepala 5, petaloidea, oblonga, 8 mm. longa, 5 mm. lata, apice rotundato-obtusa, minute 3-mucronata, basi breve cuneata, ad insertionem 1 mm. lata margine integra. Petala 5, minuta, spathulata 3 mm. longa, sursum $\frac{2}{3}$ mm. lata, deorsum $\frac{1}{2}$ mm. lata, facie extus plana, intus sursum elevata. Stamina circ. 20, circ. 4 mm. longa, filamentis filiformibus \pm complanatis, antheris orbicularibus $\frac{1}{2}$ mm. latis \pm emarginatis. Carpella circ. 10-12, complanato-linearia cum stipitibus $3\frac{1}{2}$ mm. longa $\frac{2}{3}$ mm. lata, latere facieque costata, apice revoluto-recurva, stigmatibus 1 mm. longis tenuissime pubescentibus. Folliculi oblongo-ovati, complanati, 4 mm. longi 2 mm. lati, apice oblique acuti, basi acuti, facie

1-costati, sutura dorsali sursum delhiscentes, stipitibus 4 mm. longis cum costis hirsutis, 5- 6-spermi. Semina glabra ellipsoidea 1½ mm. longa, rubra.

HAB. Rontabunzan, leg. U. MORI, Aprili. 1910.

Near *C. quenquefolia* MIQ., but quite distinguishable from it by the much larger leaves.

Dilleniaceæ.

Dillenia LINN.

Dillenia sp.

HAB. Hainan, leg. Z. KATSUMATA, 1910. Too imperfect for determination.

Anonaceæ.

Uvaria LINN.

Uvaria dolichoclada HAYATA sp. nov. Ramuli dense ferrugineo-tomentosi. Folia obovato-elliptica vel elliptica, chartacea, 10-15 cm. longa 5-6 cm. lata, apice rotundata ad summum breve acuta, basi rotundata vel cuneata ad extremitatem cordata, utraque pagine tenuiter stellato-hirsuta, costis et venis supra impressis subtus elevatis, venis primariis lateralibus utroque latere 12-13, petiolis brevissimis 2 mm. longis incrassatis. Flores axillares solitarii, vel ad apicem ramorum pedunculorum gemini, bracteis oblongis 3-5 mm. longis. Flores 2½ cm. in diametro. Sepala 3 late triangularia basi connata, utraque pagine dense hirsuta. Petala 5? crassiuscula, rotundato-cuneata, apice rotundata, basi late cuneata, 12 mm. longa 10 mm. lata, utraque pagine brevissime denseque pubescentia, basi 2 mm. lata, imbricata. Stamina ∞ , iis extimis sterilibus vel fertilibus circ. 5 mm. longis latissimis linearibus apice \pm dilatatis 1½ mm. latis basi cuneato-angustatis, intimis angustioribus 1 mm. latis, antheris 2½ mm. longis connectivis productis, partibus productis 1½ mm. longis, filamentis 1 mm. longis. Carpella ∞ , linearia, 3½ mm. longa, dense pilosa, apice glabra.

HAB. Hainan, leg. N. KONISHI, 1908, Juni. (No. 58 et 55).

Uvaria obovatifolia HAYATA sp. nov. Ramuli graciles teretes dense ferrugineo-tomentosi. Folia alterna, subsessilia, obovato-elliptica, 20 cm. longa, 8 cm. lata, chartaceo-coriacea vel tenuiter coriacea, apice rotundato-obtusa ad summum breve cuspidato-acuta, basi gradatim cuneato-angustata ad extremitatem leviter cordata, margine subintegra, in exsiccato supra fuscentia subtus fulvescentia, pinnivena, venis lateralibus primariis utroque latere costae 14-15, venis sursum arcuatis, costis et venis supra impressis subtus prominentibus, ad costas et venas tomentosa, utraque page stellato-hirsuta, petiolis brevissimis 3 mm. longis dense tomentosis. Flores axillares solitarii, pedunculis 2 cm. longis prope basin 1-bracteatis, bracteis parvis oblongis 5 mm. longis. Flores patentes 3½-4 cm. in diametro. Sepala 3, late rotundata, utraque page breve dense tomentosa, 7 mm. longa 9 mm. lata, basi connata. Petala 6, imbricata, obovato-cuneata, 2½ cm. longa, 12 mm. lata, apice rotundata, basi cuneata, ad basin 2½ mm. lata, utraque page brevissime et dense pubescentia. Stamina 8, circ. 10-seriata æquilonga, ea extima staminodia; staminodia circ. 1 em. longa 1 mm. lata linearia, apice gradatim dilatata, 1½ mm. lata, apice truncato-obtusa, ± plicata, basi attenuata. Stamina fertilia angustiora quam staminodio, 1 mm. lata, linearia, partibus antheriferis 4 mm. longis, loculis antherarum linearibus adnatis, connectivis apice productis, partibus productis 3 mm. longis apice obtusis, filamentis 2 mm. longis. Carpella 8 linearia, 7 mm. longa, dense tomentosa, apice glabra, stigmate latere canaliculato.

HAB. Hainan, leg. KATSUMADA, 1909.

Near *U. alba*, but differs by the much narrowed base of the leaves.

Uvaria purpurea BLUME, Fl. Jav. Anon. p. 13, t. 1 et t. 13-A; BENTH. Fl. Hongk. p. 9; FORBES et HEMSL. Ind. Fl. Sin. I. p. 26.

HAB. Hainan, leg. KATSUMADA, 1910.

DISTRIB. Malay archipelago and Hongkong.

Uvaria sp. nov. Near *U. purpurea* BLUME; but differs in having lanceolate petals and much smaller leaves; too imperfect for describing.

HAB. Hainan, leg. KATSUMADA, 1910.

Anona LINN.***Anona reticulata* LINN.**

HAB. Akō. cult.

Menispermaceæ.

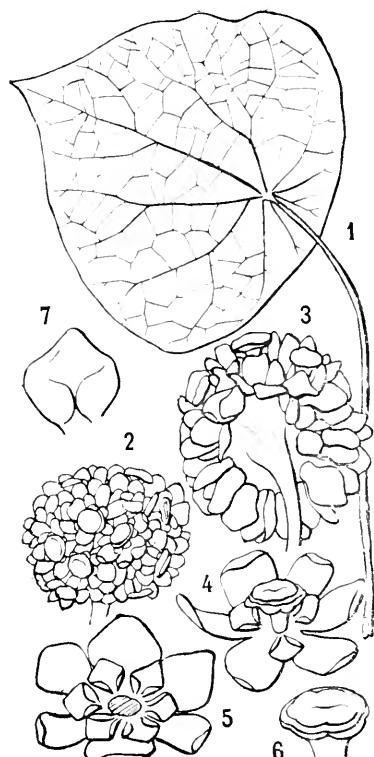
Stephania LOUR.

Fig. 4.

Stephania cepharantha HAYATA. 1, a leaf; 2, a flower-head, seen from above; 3, the same, seen from below; 4, a flower with three petals; 5, another flower with six petals, staminal column, taken off; 6, a staminal column; 7, a petal. Fig. 1, natural size; others more or less magnified.

***Stephania cepharantha* HAYATA**
sp. nov. (Fig. 4). Rami gracillimi striati, glabri. Folia glaberrima tenuissime herbacea, rotundato-triangularia, $4\frac{1}{2}$ cm. lata, totiusque longa, subtus pallida, apice obtusa ad centrum summi mucronata, basi peltata rotundata vel truncata nec emarginata nec sinuata, margine subintegra vel \pm undulata, 7–9-nervia, longe petiolata, petiolis 6–7 cm. longis gracillimis glabris. Flores capitulati, capitulis racemosis, racemis axillaribus solitariis 7–8 cm. longis gracillimis, pedunculis capitulorum gracilis 13 mm. longis basi 1-bracteatis, bracteis stipitatis laminis oblongo-triangularibus $1\frac{1}{2}$ mm. longis 1 mm. latis; rhachidibus racemorum et pedunculis capitulorum complanatis. Capitula disciformia rotundata 6 mm. in diametro, receptaculis peltatis 4 mm. in diametro, flores 19–20 gerentia. Flores medio desci; sepalis 4, linearispathulatis $1\frac{1}{2}$ mm. longis $\frac{1}{2}$ mm. latis; petalis 4, rotundatis carnosis $\frac{1}{2}$ mm. in

diametro, interdum brevissime unguiculatis. Staminum columnæ 1 mm. alta, apice peltatim dilatata, peltis rotundatis circ. 1 mm. in diametro margine antheras annulares gerentibus.

HAB. Kelung, leg. S. SASAKI, 1911, April.

Near *Stephania tetrandra* MOORE, but differs from it by the quite glabrous leaves with rounded peltate bases.

Berberideæ.

Berberis LINN.

***Berberis aristato-serrulata* HAYATA sp. nov.** (Fig. 5). Rami gracillimi striati cinerascentes aculeati, aculeis ternatis, 4 mm. longis alternis a se 5-6 cm. distantibus, ramis foliiferis brevissimis 5 mm. longis, basi perulis triangulari-cuspidatis suffultis ad axillas aculeorum sitis. Folia ad ramos brevissimos ternatim disposita, lanceolata, $5\frac{1}{2}$ cm. longa 17 mm. lata, utrinque acuta, costis supra impressis, subtus elevatis, venis et venulis supra tenuissime, subtus prominente elevatis, tenuiter coriacea margine serrulata, serrulis aristatis ascendente-erectis, petiolis 5 mm. longis. Flores

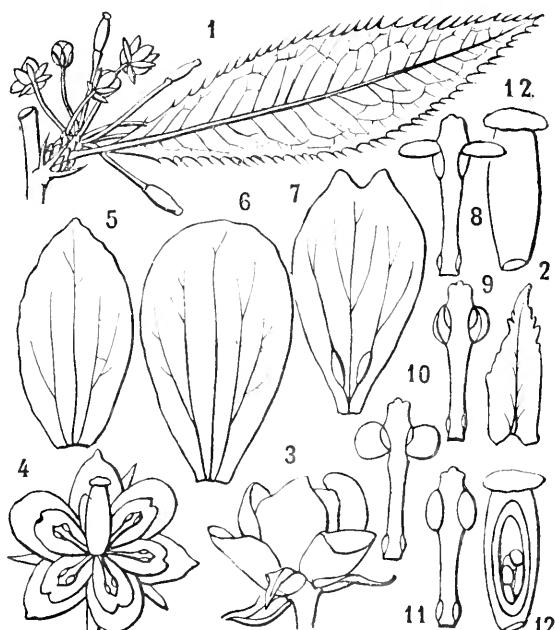


Fig. 5.

Berberis aristato-serrulata HAYATA. 1, a part of a branch; 2, an outermost sepal; 3, a flower; 4, the same, seen from above; 5, an outer sepal; 6, an inner sepal; 7, a petal; 8, 9, 10, 11, stamens; 12, an ovary; 12', the same, walls partially taken off, ovules are seen. Fig. 1, natural size; others enlarged.

fasciculati, fasciculis 10-15 floratis, ad apicem ramulorum brevissimorum terminalibus basi perulis vel bracteis plurimis suffultis, bracteis oblongis $1\frac{1}{2}$ mm. longis apice bi-aristatis vel obtusis, pedicellis 1 cm. longis. Sepala 9, in forma et magnitudine variabilissima, exterioribus 3 minoribus triangulari-oblongis $2\frac{1}{2}$ mm. longis apice acuminatis, interioribus 6 majoribus obovatis $5\frac{1}{2}$ cm. longis 4 mm. latis apice rotundatis basi cuneatis a basi $1\frac{1}{2}$ mm. latis, margine tenuibus, 3-nerviis. Petala 6, obovato-spathulata, 5 mm. longa $2\frac{1}{2}$ mm. lata, apice rotundata, bi-apiculata, basi cuneata, a basi $1\frac{1}{2}$ mm. longa, prope basin 2-glandulosa, glandulis elevatis 1 mm. longis oblongo-fusiformibus. Stamina 6, patalis opposita, 3 mm. longa, patalis breviora, filamentis complanatis incrassatis 2 mm. longis, antheris $\frac{2}{3}$ mm. longis, connectivis productis obtusis. Ovarium oboviedo-cylindricum, 3 mm. longum 1 mm. latum, infra stigma leviter contractum, 1-loculare, 2-ovulata, stigmate dilatato sessili peltato crassiusculo.

HAB. Montibus Centralibus, Aprili. 1910.

Near *B. Wedlichiana*, *B. Barandana*, and *B. Kawakamii*, but differs from them by the aristately serrulate leaves.

Berberis brevisepala HAYATA sp. nov. Rami cinerascentes, glabri, cortice longitudinaliter fisso gradatim soluto, aculeati, aculeis ternatis 11 mm. longis, utraque latere stipulo triangulari uno instructis. Folia ad ramulos brevissimos ad axillas aculeorum sitos ternatim verticillatimque disposita, obovato-lanceolata, $5\frac{1}{2}$ cm. longa, $1\frac{1}{2}$ cm. lata apice aristato-acuta, basi cuneato-attenuata, valde coriacea, costa supra impressa basi elevata venis lateralibus primariis utroque latere costæ 3-4, ad medium furcatis vix conspicuis margine serris aristatis 3 utroque latere instructa, fere sessilia. Flores 7-8-fasciculati, fasciculis ad ramos brevissimos terminalibus, basi perulis multiseriatis suffultis, pedicellis florum 1 cm. longis. Flores non visi.

HAB. Mt. Morrison, leg. U. MORI, 1910, Aprili.

Seems to be different from *B. Kawakamii* HAYATA by the less dentate leaves.

Nymphæaceæ.

Nymphaea LINN.

Nymphaea tetragona GEORG. Compared with a specimen in the Tōkyō Herbarium.

HAB. Hainan, leg. KATSUMADA.

DISTRIB. Japan, China, North India and Siberia.

Papaveraceæ.

Corydalis DC.

Corydalis campulicarpa HAYATA sp. nov. Herba 30–40 cm. alta. Folia alterna bipinnata vel pinnata, pinnis pinnatifidis, pinnulis obovatis basi acuminato-cuneatis, lobulatis, lobulis rotundatis obtusis. Flores racemosi, racemis terminalibus, bracteis minutis linearibus lanceolatis. Capsula linearis 2–3 cm. longa 2 mm. lata, multo erispata, apice cum stylis persistentibus rostrata.

HAB. Taitō, Daironkōsha, leg. U. MORI (No. 2183), 1906, Nov.

Near *C. formosana* HAYATA, but differs from that by the rather rounded smaller seeds.

Corydalis decumbens PERS., FORBES et HEMSL. Ind. Fl. Sin. I. p. 37.

HAB. Yenshiryō, leg. T. SŌMA, Feb. 1912. Compared with a specimen in the Tōkyō Herbarium.

DISTRIB. China and Japan.

Corydalis omphalocarpa HAYATA sp. nov. Herba 20–30 cm. alta. Folia alterna divaricata, 15 cm. longa 10 cm. lata, a caule angulo 90° egressa vel minus divaricata, bipinnata, pinnis infimis 5 cm. longis rotundato-cuneatis, (5 mm.–10 mm. longis) lobulatis, lobulis obtusis ad apicem mucronatis, petiolis communibus 5 cm. longis basi plus minus dilatatis. Flores 1 cm. longi, breve racemosi, racemis oppositifoliis 1 cm. longis, bracteis linearibus. Sepala 2

eadueissima, cuspidato-triangularia, 1 mm. longa, apice cuspidata \pm lobata vel integra. Petala 4, inæqualia, horizontaliter conniventia, exteriora majora apice naviculiformia angustata (supremum brevissime calcaratum vel haud calcaratum) 1 em. longa $1\frac{1}{2}$ mm. lata sursum apice \pm dilatata emarginata dorso medio carinato-alata, interiora 1 em. longa unguiculata (unguis 5 mm. longis), laminis cuneato-spathulatis 5 mm. longis apice $1\frac{1}{2}$ mm. latis rotundatis ad centrum mueronatis basi angustatis dorso medio carinatis. Stamina 6, in phalanges 2 petalis exterioribus oppositas in toto longitudine coalita, phalangibus 6 mm. longis basi 1 mm. latis complanatis supra medium sursum filiformibus, antheris mediis phalangis bilocularibus, lateralibus unilocularibus. Capsula linearis 3-3½ em. longa 3 mm. lata apice cum stylo persistente longe rostrata \pm curvata vel fere recta. Semina complanato-subrotundata, nigra, nitida, in multiseriatis annulos punctata.

HAB. Nantō: Montibus, leg. U. MORI, 1911.

Near *C. formosana* HAYATA, but differs from it by the not spurred petals, smaller flowers and narrower bracts.

Corydalis orthocarpa HAYATA sp. nov. Herba 10-20 cm. alta. Folia radicalia 15 cm. longa (petiolis communibus 7 cm. longis) bipinnata, pinnulis inciso-lobulatis obovatis basi subito cuneatis, lobulis obtusis mueronatis. Flores racemosi, racemis terminalibus vel oppositifoliis 5-6 cm. longis, bracteis lanceolatis vel ovato-lanceolatis. Sepala 2 eadueissima, rotundata, margine denticulata, 1 mm. longa. Petala 4, inæqualia; exteriora: supremum maximum cum calcaro 18 mm. longum 4 mm. latum, (calcaro 2 mm. longo totiusque lato desuper recurvo obtuso), apice latissimum emarginatum, naviculiforme dorso medio carinatum; infimum 13 mm. longum 2 mm. latum apice naviculiforme dorso medio carinatum basi ecalcaratum; interiora 13 mm. longa, unguiculata, unguibus 6 mm. longis $\frac{1}{2}$ mm. latis, laminis spathulatis 7 mm. longis $2\frac{1}{2}$ mm. latis medio dorso alatis (alis ultra apicem laminae productis), basi latere superiore brevissime auriculatis. Capsula linearis, leviter curva vel recta, 5 em. longa $2\frac{1}{2}$ mm. lata apice ad stylum abeuns, stigmate T-formi. Semina ignota.

HAB. Fokien: Usekisan, leg. S. NAGASAWA, (No. 149), 1910, Juli.

Macleya R. Br.

Macleya cordata R. Br.; DEELS Fl. Centr. Chin. p. 353; MATSUM. Ind. Pl. Jap. II.-2, p. 146.

Becconia cordata Willd.; FORBES et HEMSL. Ind. Fl. Sin. I. p. 35.

HAB. Ritōzan, ad 6500 ped. alt., Aug. 1913, leg. T. KAWAKAMI.

DISTRIB. China and Japan throughout.

Cruciferæ.

Nasturtium Br.

Nasturtium globosum Turez.; FORBES et HEMSL. Ind. Fl. Sin. I. p. 39; NAKAI Fl. Koreana I. p. 51.

HAB. Maisha, leg. T. SōMA, Oct. 1910.

Compared with a specimen in the Corean collections in the Tōkyō Herbarium.

DISTRIB. Siberia; China: Peking, Kwangtung; Corea.

Nasturtium sikokianum F. et S. var. **axillare** HAYATA n. v. Herba glabra caespitosa radiatim procumbens, sursum ascendens, ramosa, ramis erecto-ascendentibus glabris 10 cm. longis. Folia radicaria circumscriptio spathulata, 7 cm. longa, sursum latissima 3 cm. lata, apice obtusa, basi cuneato-attenuata in circumscriptio, pinnatifida, sessilia, (segmentis dentatis vel acuto-lobatis, terminali ovato, lateralibus horizontaliter patentibus vel descedentibus infimis 5 mm. longis), ad basin dilatata caulem semi-amplectantia. Folia caulinata alterna obovato-spathulata, pinnatifida 4-2 cm. longa interdum grosse dentata. Flores semper axillares, solitarii, sessiles vel brevissime pedicellati. Sepala obovata, 2 mm. longa 1 mm. lata, apice obtusa, basi subcuneata, intus glabra dorso sursum muricata. Petala spathulata 2½ mm. longa, ½ mm. lata basi unguiculata, (unguis 1 mm. longis), apice rotundato-emarginata. Stamina 6, filamentis complanatis. Ovarium complanatum, cylindraceum 1½ mm. longum ⅔ mm. latum. Siliqua brevissime pedicellata

cylindracea complanata, 8 mm. longa, circ. 2 mm. lata, glabra, utraque obtusa. Semina numerosa oblique reniformia $\frac{1}{2}$ mm. lata, testa reticulata.

HAB. Fokien : Kosen, leg. S. NAGASAWA, Aprili. 1910. (No. 258.)

Differs from the type by the much larger bracts which are so large as cauline leaves. Petals are usually in a transitional stage between stamens and themselves. They have very often an anther-cell on one side. I could find but one normal petal out of several which I examined in many flowers.

Arabis LINN.

Arabis kelung-insularis HAYATA sp. nov. Perennis?, erecta 30 cm. longa, sursum ramosa, brevissime stellato-hirsuta. Folia radicalia non vissa. Folia caulina inferiora ovata, 5 cm. longa 3 cm. lata, apice rotundata, margine deorsum grosse dentata vel denticulata, sursum subintegra, sessilia basi auriculato-cordata, folia superiora minora oblonga 3 cm. longa 1 cm. lata basi sessilia auriculata apice obtusa vel acutiuscula folia omnia crassiuscula, margine irregulariter denticulata, utraque pagine tenuissime pilosa, pilis brevissimis simplicibus furcatis vel stellatis. Racemi ad apicem ramorum terminales, flores non visi. Siliqua linearis, recta, suberecta, $3\frac{1}{2}$ cm. longa 2 mm. lata, complanata utrinque obtusa, facie medio 1-costata, nervosa. Semina valde complanata, rotundata, $1\frac{1}{5}$ mm. in diametro.

HAB. Insul. Kelung, leg. S. SASAKI, 1910, Mai.

Arabis lithophila HAYATA sp. nov. Herba annua? pilosiuscula; caulis 30 cm. longus, sub-simplex. Folia radicalia obovato-spathulata, 10 cm. longa $3\frac{1}{2}$ cm. lata apice rotundata, a medio deorsum attenuata, ad basin 1 cm. lata, margine subintegra, crassiuscula, utraque tenuissime pilosa, pilis brevissimis simplicibus furcatis vel stellatis, folia caulina minora oblongo-lanceolata basi auriculata margine denticulata. Racemi terminales. Sepala obovata oblonga, 3 mm. longa, $1\frac{1}{2}$ mm. lata, apice obtusa, 5-nervia. Petala obovato-cuneata 5 mm. longa prope apicem 2 mm. lata apice rotundata deorsum cuneata ad basin subunguiculata. Stamina 6, 4 mm. longa, antheris oblongo-linearibus apice apiculatis. Stigma subsessile integrum vel tenuissime

2-lobatum. Siliqua linearis erecta, recta, 5 cm. longa, 2 mm. lata, facie medium terniter costata, nervosa.

HAB. Fukkikaku, leg. S. SASAKI, Aprili. 1910.

Cardamine LINN.

Cardamine agyokumontana HAYATA sp. nov. (Fig. 6). Herba tenuissima perennis, rhizoma erectum tuberiferum in speciminibus nostris 1 cm.

longum radices filiformes rubras numerosas emittens, caulis pilosiusculus simplex. Folia radicalia longe petiolata, glabra, cordato-reniformia 2 cm. lata $1\frac{1}{2}$ cm. longa, membranacea apicem rotundata basi reniformia ad extremitatem acuta ad petiolum abeuntia, margine crenulata, ad sinus crenarum breve mucronata, 5-7-nervia, nervis subrectis ad sinus crenarum attingentibus, petiolis 4 cm. longis glabris. Folia caulinata 1-2. Racemi breves 1 cm. longi, terminales, pedicellis 5 mm. longis. Sepala oblonga, utrinque obtusissima, 3 mm. longa $1\frac{1}{2}$ mm. lata, glabra. Petala obovato-spathulata $7\frac{1}{2}$ mm. longa 4 mm. lata, apice rotundata, a medio deorsum subito cuneata ad unguem abeuntia, basi unguiculata. Stamina 6, $4\frac{1}{2}$ mm. longa, filamentis complanatis, antheris oblongo-linearibus 1 mm. longis apice obtusis basi 2-lobatis. Ovarium erectum lineare $4\frac{1}{2}$ mm. longum $\frac{1}{2}$ mm. latum. Siliqua non visa.

HAB. Mt. Agyoku, 4000 ped. alt., leg. S. KATÔ, Juni. 1909.

Near *Cardamine circaeoides* HOOK

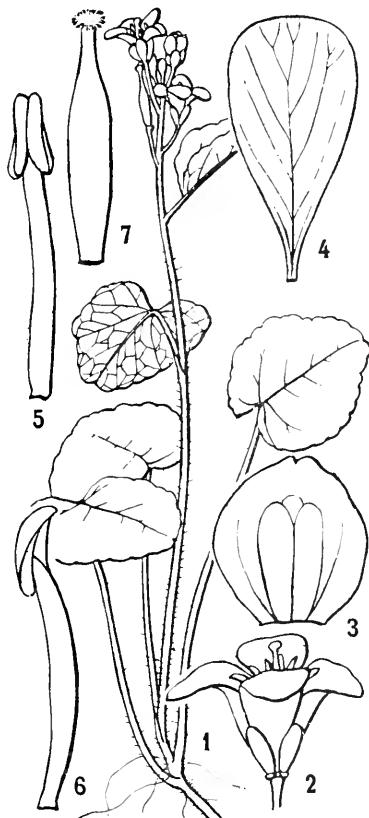


Fig. 6.

Cardamine agyokumontana HAYATA. 1, the plant; 2, a flower, 3, a sepal; 4, a petal; 5, 6, stamens; 7, an ovary. Fig. 1, natural size; fig. 2-7, more or less magnified.

f. et THOMS. (in Fl. Brit. Ind. I. p. 137); but differs from it by the far much smaller form.

Cardamine arisanensis HAYATA sp. nov. (Fig. 7). Perennis; caulis 30–40 cm. longus, glaber, sulcatus, superiore subramosus. Folia radicalia lyrata, longe petiolata, cum petiolis 10–15 cm. longa, in ambitu spathulata, apice rotundata, basi gradatim angusta, segmentis utroque latere 11–12 obovatis subpetiolulatis, segmento terminali obovato subtrilobato maximo minus 1 cm. longo, segmentis inferioribus gradatim minoribus linearibus $\frac{1}{2}$ cm. longis a se $\frac{1}{2}$ cm. distantibus glabris, petiolis circ. 7 cm. longis lamina

longioribus vel brevioribus.

Folia caulina iis radicalibus breviora, 5 cm. longa segmentis minoribus pauci oribus. Racemi terminales dense florati, pedicellis 2–3 mm. longis leviter pubescentibus, floribus 3 mm. longis. Sepala 4, linearia $2\frac{1}{2}$ mm. longa $\frac{3}{8}$ mm. lata dorso hirsuta leviter carinata. Petala 4, spathulata, sursum latiora 3 mm. longa 1 mm. lata, apice rotundata vel obtusa, ad basin gradatim attenuata, glabra, (alba?). Stamina 6, $2\frac{1}{2}$ mm.

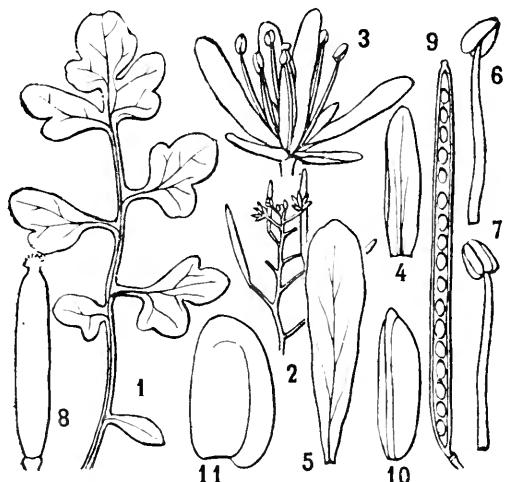


Fig. 7.

Cardamine arisanensis HAYATA. 1, a leaf; 2, an inflorescence; 3, a flower; 4, a sepal; 5, a petal; 6, 7, stamens; 8, an ovary; 9, a pod; 10, 11, a seed, seen from different sides. Fig. 1–2, natural size; 3–11, more or less magnified.

longa, filamentis complanatis, glandulis interstaminibus brevibus dentiformibus $\frac{1}{10}$ mm. longis. Ovarium lineare $2\frac{1}{2}$ mm. longum leviter hirsutum. Siliqua erecta, linearia complanata $2\frac{1}{2}$ cm. longa, minus 1 mm. lata apice angustata truncata basi subaequilata vel plus minus contracta, valvis submembranaceis.

HAB. In Monte Morrison, ad 10000–11000 ped. alt., leg. T. KAWAKAMI et U. MORI, 1906, Oct. (No. 2252); in Montibus Centralibus, Feb. 1908.

Eutrema Br.

Eutrema hederæfolia F. et S. Enum. Pl. Jap. II. p. 283.

Wasabia tenuis MATSUM. Ind. Pl. Jap. II.-2, p. 161.

HAB. Kelung, leg. T. YUBASHI, Juli., 23, 1910.

Compared with a Japanese specimen in the Tôkyô Herbarium.

DISTRIB. Japan.

Capparideæ.

Capparis LINN.

Capparis Henryi MATSUM. in MATSUM. et HAYATA Enum. Pl. Formos. p. 26, t. III.

DESCRIPTIO AUCTATA: Fructus oblongo-globosus 23 mm. longus 18 mm. latus, facie rugosus impresso-reticulato-punctatus tenuissime impresse 7-sulcatus, carpellis incrassatis lignosis flavescentibus; stipitibus fructus 2 cm. longis validissimis rectis, pedicellis 1 cm. longis descendento-recurvis. Semina numerosa, subcomplanata, subrotundata, 3 mm. lata, totiusque longa, basi profunde cordata, medio impressa, testa castaneo-rubescenti levi subnitida.

HAB. Kôshûn: Kuraru, leg. B. HAYATA, Aug. 1913.

Capparis Kikuchii HAYATA sp. nov. Rami glabri, minute striati, subrecti, laeves. Folia alterna, oblonga, vel lanceolata, plus minus obliqua, in exsiccato coriaceo-membranacea vel membranacea, 8-9 cm. longa 3-4 cm. lata, utrinque acuta, vel apice breve cuspidato-acuta, ad summum obtusa, utraque glabra, margine integra costis supra medio sulcatis subtus elevatis, venis et venulis utraque pagine elevatis reticulatis, petiolis 1 cm. longis. Flores semper geminatim ad axillas foliorum siti, pedicellis 1-2 cm. longis petiolo longioribus erectis. Sepala 4, extus glabra, intus tenuiter pubescentia, altra 2 latiora 7 mm. longa 4 mm. lata valde concava, altra 2 angustiora. Petala 4 lanceolata, utrinque obtusa utraque pagine tomentosa, 12 mm. longa, 4 mm. lata, basi cuneata. Stamina 8, 3 cm. longa, antheris oblongo-linearibus 1½ mm. longis. Ovarium longe stipitatum, (stipitibus 2½ cm. longis filiformi-

bus), ovoidum $1\frac{1}{2}$ mm. longum apice acutum, glandula una ad receptaculum antice sita.

HAB. Tōkō, leg. Y. KIKUCHI, 1913, Juni.

Capparis leptophylla HAYATA sp. nov. Frutex. Rami teretes subrecti, tenuissime pubescentes, brevissime remoteque spinosi, spinis recurvis $1\frac{1}{2}$ mm. longis apice acutis basi dilatatis. Folia alterna membranacea, lanceolata 10 cm. longa 3 cm. lata, apice acuminata ad summum obtusa, basi obtusa, margine subintegra, costis supra impressis vel tenuiter sulcatis subtus elevatis, venis et venulis utraque elevatis reticulatis, venis primariis lateralibus numerosis utroque latere costæ 10–20, utraque pagine glabra, petiolis 5 mm. longis supra tenuiter sulcatis, spinis utroque latere basis petiolorum dispositis. Flores solitarii, supra-axillares, a axilla foliorum 3 mm. remoti, pedicellis 6 mm. longis erectis tenuissime pubescentibus. Sepala 4, oblonga valde concava, 8 mm. longa in explicatio 5 mm. lata, glabra vel ad apicem leviter pubescentia. Petala 4, obovata oblongo-rectangularia, 10 cm. longa $4\frac{1}{2}$ mm. lata, apice rotundata basi angustata, intus glabra, extus pubescentia. Stamina ∞ numerosae filamentis 18 mm. longis, antheris oblongo-linearibus 2 mm. longis utrinqu, obtusis. Ovarium longe stipitatum, (stipite 3 mm. longo), ovoido-conicum 2 mm. longum, 1 mm. latum apice acutum. Fructus ignotus.

HAB. Akō: Mankinshō, leg. S. SASAKI, Mart. 1910.

Near *C. membranacea* but differs from it by the much thinner leaves and shorter prickles.

Capparis oligostema HAYATA sp. nov. Frutex scandens? Rami glabri subrecti vel subflexuosi, inermi, cortice lœvi flavo-fuscenti tilongitudinaliter rugoso. Folia oblongo-ovata vel oblongo-obovata, $5\frac{1}{2}$ cm. longa $3\frac{1}{2}$ cm. lata, apice obtusa ad summum obscurè mucronata vel obtusa, basi obtusa vel rotundata, crassiuseula exsiccato coriacea viridiscentia, utraque glabra secundum costam tenuiter plicata, costa supra plana vel sulcata subtus elevata, venis lateralibus tenuissimis supra \pm elevatis subtus non conspicuus, margine integerrima leviter desuper recurva, petiolis brevioribus $1-1\frac{1}{2}$ cm. longis intus sulcatis. Flores parvi umbellato-paniculati, paniculis terminalibus

vel axillaribus 5 cm. longis. Sepala 4? oblongo-rotundata. Petala 4? oblonga. Stamina 8, anthera oblongo-linearis apice apiculata. Ovarium stipitatum. Fructus baccatus longe pedicellatus et stipitatus, globoso-ovoideus vernicosus, cum stipitibus 3 cm. longus 12 mm. latus apice truncatus basi subito attenuatus ad stipitem 6-7 mm. longum abeuns, generaliter 2-spermus.

HAB. Kōshūn, Kuraru, Mai. 30, 1912, leg. B. HAYATA, (Fl.); leg. S. KUSANO, Jan. 1909, (Fr.).

Remarkable for the smallness of flowers and the paucity of stamens which are as few as eight in one flower.

Capparis tenuifolia HAYATA sp. nov. Rami subglabri, minute striati, subrecti. Folia crassiuscula, in exsiccato membranacea, tenuissima, alterna, ovata vel ovato-oblonga, 7 cm. longa, 3 cm. lata, apice acuta ad summum obtusa, basi obtusa, venis venulisque tenuissimis, utraque glabra, margine integra. Flores geminatim superpositi, axillares, pedicellis 17 mm. longis erectis. Sepala 4, altra 2 majora valde concava 5 mm. longa 3 mm. lata utrinque glabra, altra 2 minora, apice pubescentia. Petala 4, obovato-oblonga, 6 mm. longa, 3 mm. lata, apice rotundata, basi acuta, intus glabra, extus pubescentia. Stamina 8, antheris oblongo-linearibus 1½ mm. longis. Ovarium longe stipitatum, (stipite 2 cm. longo), ovoido-conicum 1 mm. longum, apice acutum.

HAB. Akō: Tōkō, leg. U. MORI, Aprili. 1907, (No. 2930).

Violaceæ.

Viola LINN.

Viola adenothrix HAYATA sp. nov. (Fig. 9.) Rhizoma ascendens ad apicem folia radicalia seapos et stolones emittens, stolonibus procumbentibus ad nodos radicantibus. Folia radicalia hirsuta longe petiolata, lamina oblongo-cordata, apice acuta margine serrulato-crenata, basi leviter cordata, 2½ cm. longa 18 mm. lata, supra parce hirsuta, subtus ad venas dense hirsuta, petiolis 4 cm. longis dense hirsutis, pilis patentibus, stipulis cuspidato-ovatis.

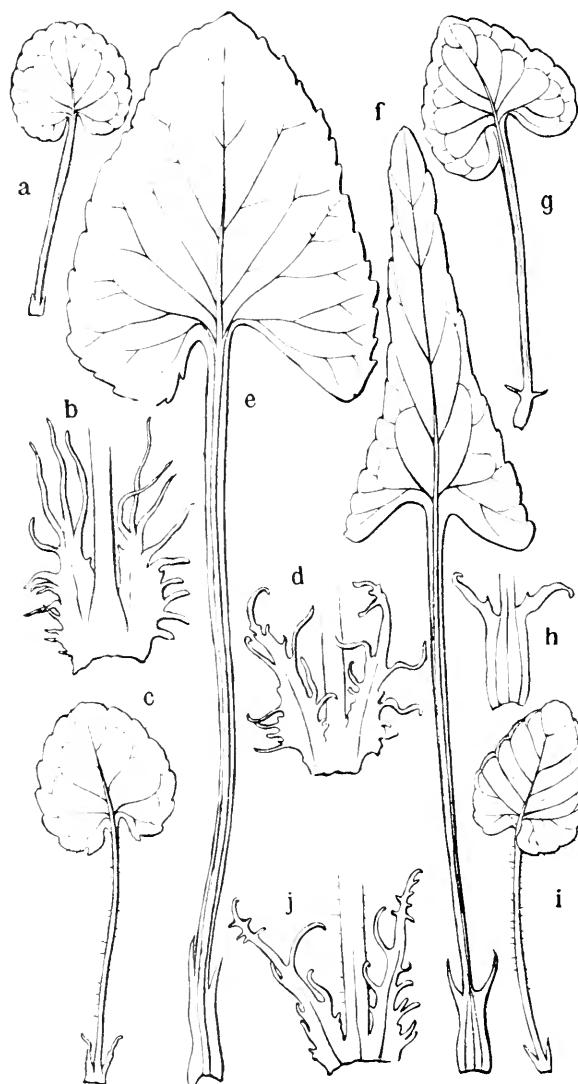


Fig. 8.

Viola spp., leaves and stipules.

a, b = *Viola formosana* HAYATA ; c, d = *Viola Nagasawai* HAYATA ;
 e = *Viola japonica* LANGSD. ; f = *Viola Patrinii* DC. ;
 g, h = *Viola verecunda* A. GRAY ; i, j = *Viola diffusa* DING.

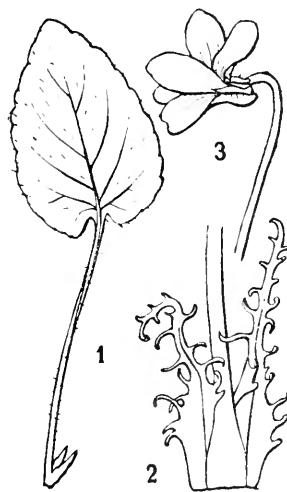


Fig. 9.

Viola adenothrix HAYATA. 1, a leaf; 2, stipules; 3, a flower. Fig. 1 and 3, natural size; fig. 2, magnified.

supra basin glandulosohirsuta, pilis apice clavatis, inferius 7 mm. longum $3\frac{1}{2}$ mm. latum apice truncato-emarginatum basi calecaratum (caleari brevissimo $1\frac{1}{2}$ mm. longo 2 mm. lato). Stigma terminale cupuliforme.

HAB. Arisan: Bandaian, leg. B. HAYATA et S. SASAKI, Jan. 1912.

Near *V. brachycantha*, but differs from it in having runners and in the position of bracts.

***Viola brachycantha* HAYATA sp. nov. (Fig 10.)** Rhizoma ascendens squamosum, ad apieem folia radicalia et scapos gerens.

obliquis basi ovatis apice cuspidoformibus margine fimbriatis 8 mm. longis 3 mm. latis extus hirsutis, stipulis foliorum stolonis angustioribus margine dentato-ciliolatis. Scapi 5-7 cm. longi, sursum bracteis 2 instructi, bracteis linearibus 6 mm. longis $\frac{2}{3}$ mm. latis margine ciliatis dorso hirsutis intus glabris. Sepala oblonga, inaequalia $4\frac{1}{2}$ mm. longa, $1\frac{1}{2}$ mm. lata, hirsuta. Petala inaequalia, superiora obovato-cuneata 8 mm. longa, 4 mm. lata apice rotundata, basi cuneata, lateralia oblique oblongo-rectangularia 8 mm. longa $3\frac{1}{2}$ mm. lata apice truncata basi obtusa

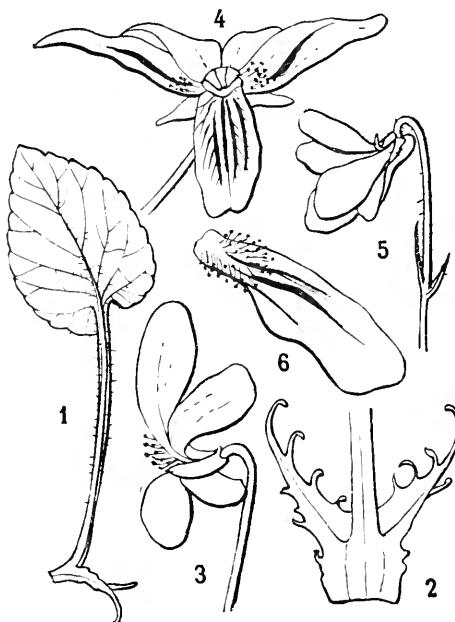


Fig. 10.

Viola brachycantha HAYATA. 1, a leaf; 2, stipules; 3, a flower seen from side; 4, the same, seen from front; 5, another flower seen from side; 6, a wing. 1 and 5 natural size; 2, 3, 4 and 6, more or less magnified.

Folia omnia radicalia longe petiolata hirsuta, lamina cordata vel oblongo-cordata 2-3 em. longa, 23 mm. lata, membranacea, utraque pagine parce pubescenti, subtus ad venas pubescenti, (margine crenulata ad sinus obscure mucronata), apice acuta, obtusa, basi profunde cordata, petiolis 5 cm. longis hirsutis basi utrinque stipulis instructis, stipulis oblique ovatis 8 mm. longis, basi petioli adnatis margine fimbriatis 1-costatis. Scapi 5-10 em. longi, parceissime hirsuti, infra medium bracteis 2 instructi, bracteis linearibus 7 mm. longis basi dilatatis. Sepala leviter inæqualia, lanceolato-ovata, extus hirsuta, intus glabra, ultra basin producta. Petala inæqualia, 2 superiora obovata apice rotundata basi acuminata 13 mm. longa $7\frac{1}{2}$ mm. lata, lateralia obliqua obovato-rectangularia 13 mm. longa 6 mm. lata apice rotundata basi subunguiculata versus basin intus glanduloso-hirsuta (pilis apice globuliferis), inferius brevissimum 10 mm. longum 4 mm. latum rectangulare apice trunatum oblique emarginatum basi brevissime calcaratum (calcar 2 mm. longo totiusque lato) cœruleum, altra albicantia.

HAB. Arisan : Taroyen, leg. B. HAYATA et S. SASAKI, Jan. 20, 1912.

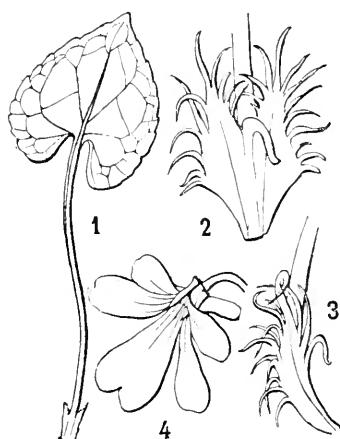


Fig. 11.

Viola hypoleuca HAYATA. 1, a leaf; 2, stipules seen from back; 3, the same, seen from side; 4, a flower. Fig. 1 and 4, natural size, fig. 2 and 3, magnified.

***Viola hypoleuca* HAYATA sp. nov.**

(Fig. 11.) Rhizoma erecto-ascendens. Folia omnia radicalia vel rarius caulinata, longe petiolata, lamina cordata apice obtusa vel acuta basi auriculato-cordata vel cordata 3 em. longa $2\frac{1}{2}$ em. lata, (sinu basili 4 mm. lato), ab insertione petioli usque ad lobos basilares 1 cm. longa, margine denticulato-crenulata supra prope sinus fasciculis pilorum instructa, cæterum glabra, subtus omnino glabra pallido-albicanti crassinscula, venis supra elevatis subtus planis distinctis, petiolis 9 cm. longis glabris, stipulis rubescientibus ovatis vel linearibus basi petiolorum adnatis 4 mm. longis margine valde fimbriatis. Scapi 10-15 cm. longi, basi squamis

fimbriatis 1-2 instructi, versus apicem 2-bracteis instructi, bracteis linearibus 5 mm. longis basi parcissime fimbriatis vel subintegris. Sepala inæqualia linearia 6 mm. longa 1½ mm. lata apice obtusa basi truncata, ultra basin producta. Petala inæqualia, superiora brevissima obovato-oblonga apice truncato-rotundata basi cuneata 10 mm. longa 4½ mm. lata prope basin oblique reflexa, lateralia oblongo-cuneata 15 mm. longa 6 mm. lata apice truncato-emarginata basi cuneata, inferius longissimum obovato-cuneatum 18 mm.

longum versus apicem latissimum 1 cm. latum apice rotundatum, profunde emarginatum vel leviter 2-lobatum, basi cuneatum, calcaratum, (calcarum 6 mm. longo 2 mm. lato recto vel leviter recurvato).

HAB. Tonkurankei, leg. U. Mori, 1910, Aprili.

Near *V. formosana* HAYATA, but differs from it in having leaves with obtuse apex.

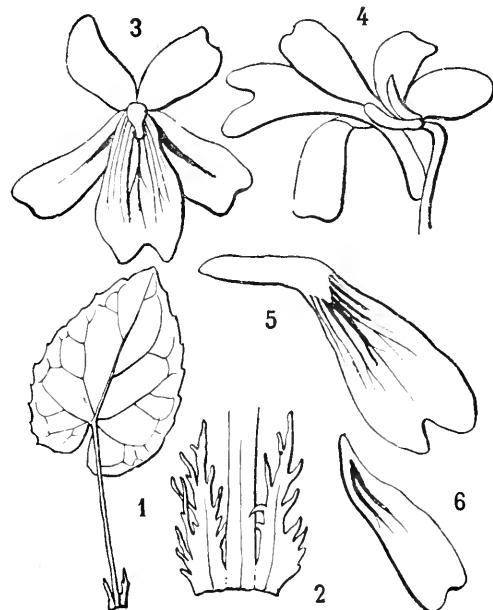


Fig. 12.

Viola Kawakamii HAYATA. 1, a leaf; 2, stipules; 3, a flower, seen from front; 4, the same, seen from side; 5, a lip; 6, a wing. 1, natural size, others more or less magnified.

Viola Kawakamii

HAYATA (Fig. 12). Ic. Pl. Formos. I. p. 58.

HAB. Inter Funkiko et Taroyen, Jan. 20, 1912, leg. B. HAYATA et S. SASAKI.

Viola Kawakamii HAYATA var. **stenopetala** HAYATA n. v. (Fig. 13).

Petala lineari-cuneata, superiora lineari-cuneata 10 cm. longa 3 mm. lata apice subtruncata basi cuneato-attenuata; lateralia 13 mm. longa 3½ mm. lata, inferius cum calcarum 23 mm. longum lineari-cuneatum 5 mm. latum apice 2-lobatum

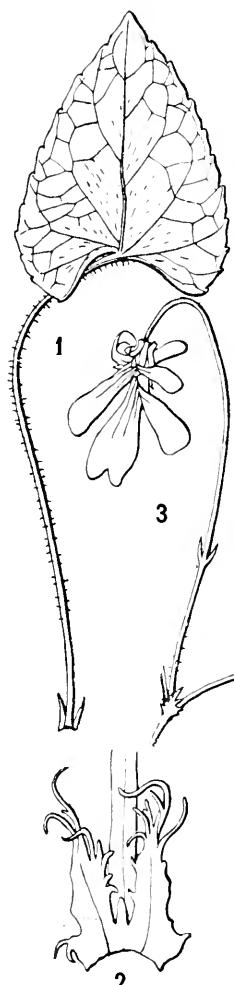


Fig. 13.

Viola Kawakamii HAYATA var. *stenopetala* HAYATA. 1, a leaf; 2, stipules; 3, a flower. Fig. 1 and 3, natural size, fig. 2, magnified.

inferius linearis-oblongum 7 mm. longum $2\frac{1}{2}$ mm. latum apice rotundatum basi calcaratum, calcari 3 mm. longo 2 mm. lato recto. Stigma terminale botrioidem.

HAB. Fôkien : Kosan, leg. S. NAGASAWA, 1910, April.

basi cuneato-attenuatum calcaratum, calcari 6 mm. longo $1\frac{1}{2}$ mm. lato subrecto.

HAB. Arisan : leg. B. HAYATA et S. SASAKI Jan. 1912.

Differs from the type by the much narrower petals.

Viola kosanensis HAYATA sp. nov. Rhizoma ascendens squamosum, ad apicem folia radicalia et scapum gerens. Folia omnia radicalia, longe petiolata, lamina ovato-cordata apice acuta vel obtusa, basi profunde cordata, $2\frac{1}{2}$ cm. longa totiusque lata, margine crenata, supra parecissime hirsuta vel subglabra, subtus pallidisima glaberrima, petiolis glabris 5 cm. longis, stipulis linearibus apice acuminatis basi plus minus latioribus longe fimbriatis 1 em. longis basi $1\frac{1}{2}$ mm. latis. Scapi 6-8 cm. longi, versus apicem bracteis 2 suboppositim instructi, bracteis linearibus 5 mm. longis basi \pm latioribus $\frac{1}{2}$ mm. latis basi dentibus filiformibus 1-3 instructis. Sepala lanceolata inaequalia apice obtusa basi truncata ultra insertionem producta 5-6 mm. longa. Petala inaequalia superiora 2 obovato-oblonga apice rotundata basi subunguiculata supra basin valde reflexa 9 mm. longa 3 mm. lata, lateralia longiora semi-oblonga, vel semi-ovato-oblonga 11 mm. longa 3 mm. lata apice obtusa vel obtuso-rotundata basi attenuata,

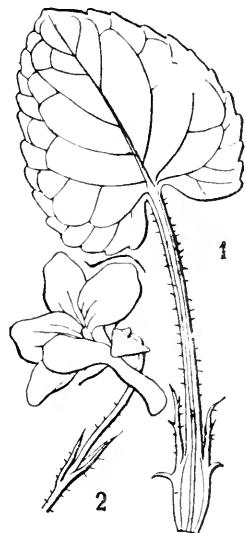


Fig. 14.

Viola longistipulata HAYATA.
1, a leaf; 2, a flower. All figures, natural size.

Viola longistipulata HAYATA sp. nov. (Fig. 14.) Folia fere omnia radicalia longe petiolata rotundato-cordata 3 em. longa totiusque lata apice obtusa basi cordata margine obtuso-serrulata utraque pageine hirsuta, petiolis 5 em. longis parce hirsutis, stipulis basi petiolum adnatis linearilanceolatis 16 mm. longis apice acuminatis basi latere interiore cum petiolis connatis margine breve remoteque fimbriato-ciliatis. Scapi 5-7 cm. longi hirsuti supra medium bracteis oppositis 2 instructi, bracteis linearibus 1 em. longis 1 mm. latis. Sepala ovata inaequalia, 8 mm. longa, 3½ mm. lata, dorso et margine ciliolata. Petala superiore et lateralia subæqualia obovata, 13 mm. longa, 7 mm. lata, apice rotundata, basi cuneata, inferius cum calcari 2 em. longum obovatum 6 mm. latum basi calcaratum, calcari 7 mm. longo 2½ mm. lato subrecto sensim superiore recurvato.

HAB. Formosa: loco non indicato.

Viola thrichopoda HAYATA sp. nov. (Fig. 15). Folia omnia radicalia breviuscule petiolata, lamina late-ovata apice obtusa basi leviter cordata 19 mm. longa 13 mm. lata margine crenulato-denticulata, utraque pageine subglabra, margine ciliata, petiolis lamina brevioribus saepe dimidium laminæ

æquantibus patento-hirsutis basi dilatatis, stipulis linearilanceolatis 1 cm. longis basi dilatatis basi petioli adnatis margine ciliolato-fimbriatis apice linearibus. Scapi 5 cm. longi, a medio deorsum hirsuti, sursum glabri, medio bracteis 2 suboppositis instructi, bracteis linearibus 7 mm. longis. Sepala

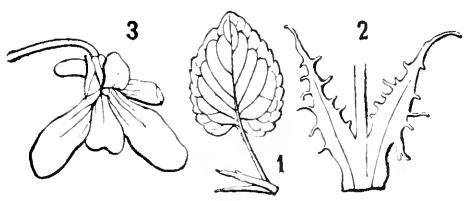


Fig. 15.

Viola thrichopoda HAYATA. 1, a leaf; 2, stipules; 3, a flower. Fig. 1 and 3, natural size, fig. 2, magnified.

lanceolato-linearia 6 mm. longa 1½ mm. lata margine ciliolata. Petala 2-superiora obovata basi cuneata 1 cm. longa, lateralia oblique obovato-oblonga 1½ cm. longa 6½ mm. lata apice rotundata basi oblique cuneata prope basin glanduloso-hirsuta (pilis clavatis), inferius cum calcari 13 mm. longum 4½ mm. latum oblongum apice emarginatum ad centrum brevissime mucronatum basi calcaratum, calcari 3 mm. longo totiusque lato.

HAB. Chiakankei, ad 6000 ped. alt., leg. U. MORI, Jan. 1908.

Near *V. sylvestris* KIT., but differs from it by the ciliate petioles.

Bixineæ.

Casearia JACQ.

Casearia **Merrilli** HAYATA sp. nov. (Tab. III.) Frutex. Rami recti vel flexuosi, glabri. Folia disticha alterna, oblonga, elliptica, 15 cm. longa 5½ cm. lata, apice breve acuminata vel acuta ad summum obtusa, basi oblique truncata rotundata vel acuta chartacea pellucido-punctata, margine obtusa obscure denticulata, dentibus 4 mm. latis 1½ mm. longis, costa supra sulcata vel plana subtus elevata, venis lateralibus utraque tenuiter elevatis, supra et subtus ad costas et prope costas tenuiter hirsuta, cæterum glabra, venis lateralibus primariis utroque latere costæ 10–13. Flores ad axillas dense 20–30 clustati, pedicellis 10–5 mm. longis hirsutis basi articulatis bracteatis, bracteis rotundatis vel angulatis planis vel concavis hirsutis ciliatis 1 mm. longis. Sepala 5 basi connata imbricata, oblongo-rotundata, extus hirsuta intus glabra, margine ciliata, 2–3 mm. longa. Petala 0. Stamina 8, basi calycis affixa, filamentis incrassatis hirsutis, antheris oblongo-ovatis basi cordatis apice emarginatis. Staminodia 8, cum staminibus alterna incrassata claviformia hirsuta cum filamentis æquilonga. Ovarium cylindrico-conicum glabrum uni-loculare 4-ovulatum, placentis parietalibus 2, ovulis erectis, micropyle superiore, stylo brevissimo, stigmate leviter 2–3-lobato. Bacca ellipsoidea; pericarpium carnosum facie botrioideo-punctatum.

HAB. Kōshūn: Kuraru, (Fl.); Holisha, leg. R. KANAHIRA, Mart. 1912, (Fr.); Uraisha, Mart. 1910, S. KATō, (Fr.).

This new species is named after Mr. E. D. MERRILL, who courteously compared it with all the species of the genus of the Philippines and suggested me that it may be a plant not yet described.

Pittosporeæ.

Pittosporum BANKS.

Pittosporum oligospermum HAYATA sp. nov. Frutex? Rami graciles glabri, apice quasi-verticillatim foliati. Folia tenuiter coriacea, obovato-oblonga, 8 cm. longa 27 mm. lata, apice cuspidato-acuminata, basi cuneata, utraque glabra, margine undulata, supra nitida, subtus pallidissima, costis et venis supra planis inconspicuis, venulis minute impresso-reticulatis, subtus costis elevatis, venis et venulis inconspicuis, petiolis 5 mm. longis supra sulcatis. Flores ignoti. Fructus ad apicem ramorum 3-4-fasciculati, longe pedicellati, pedicellis gracilibus 3 cm. longis. Capsula globosa, valvis 3 oblongis utrinque acutis 1 cm. longis crassiusculis lignosis. Semina pauca angulato-oblonga, 4 mm. longa, angulata, rubescentia.

HAB. Formosa: loco non indicato.

Near *P. glabratum*, but differs from it by the much smaller fruits; and from *P. pauciflorum* by the much more acuminate leaves.

Pittosporum parvifolium HAYATA sp. nov. Frutex. Rami ramosissimi, dense foliati. Folia obovata vel cuneato-obovata, subsessilia, 3-4 cm. longa 1½-2 cm. lata, apice obtusa, rotundata, rarius leviter emarginata, basi attenuata vel cuneato-attenuata, utraque glabra, costis supra impressis, subtus elevatis venis et venulis supra impressis distincte reticulatis, subtus non distinctis, coriacea margine desuper leviter recurva, integra vel ± undulata, petiolis brevissimis 2 mm. longis. Flores ignoti. Capsula obovata 3-gona, 14 mm. longa, 12 mm. lata, apice cum stylo apiculata, basi obtusa, 3-valvata, valvis una majora, altris minoribus crassis lignosis. Semina 20-40, depresso-complanato-globosa, 2-3 mm. longa, nigro-rubescentia.

HAB. Bonin: Chichijima, leg. H. HATTORI. Juli. 1905.

Pittosporum viburnifolium HAYATA sp. nov. Rami validiusculi, cortice cinerascenti. Folia crassiuscula, oblongo-ovata, 12 cm. longa, $5\frac{1}{2}$ cm. lata, apice rotundata vel obtusa, basi cuneata, utraque glabra, subitus pallida, costis et venis supra impressis subitus valde elevatis venis primariis arenatis, utroque latere costæ 6, margine integerrima leviter recurvata. Flores ignoti. Fructus in paniculam terminalem 10 cm. longam 8 cm. latam laxe dispositi, pedicellis $1\frac{1}{2}$ cm. longis capsula æquilongis. Capsula subglobosa, 2-valvata, valvis late rotundatis 2 cm. longis $2\frac{1}{2}$ cm. latis, crassiusculis coriaceo-lignosis. Semina rubescens oblonga vel semi-oblonga 7 mm. longa, apice ± recurvata.

HAB. Kōtōshō : leg. S. SASAKI, Juni. 1911.

Polygaleæ.

Salomonia Lour.

Salomonia stricta S. et Z. ; MATSUM. Ind. Pl. Jap. II.-2, p. 299.

HAB. Tōyen : Daigyorinsho leg. T. INOUYE, Sept. 1908.

Compared with a Japanese specimen in the Tōkyō Herbarium.

DISTRIB. Japan.

Polygala LINN.

Polygala crassiuscula HAYATA sp. nov. Suffrutescens glabra, 20 cm. alta, saepe simplex, rarius paucissime ramosa. Folia lanceolata, alterna, crassiuscula, in exsiccato membranacea, 6 cm. longa, 17 mm. lata, apice acuta vel acuminata ad summum tenuiter aristata, basi obtusa, margine integra sed versus apicem minute aristato-ciliolata, subitus pallidissima, venis lateralibus utroque latere 3-4 arenatis apice eam superiorem proximam attingentibus, petiolis 12 mm. longis. Flores purpurei ? racemosi, racemis terminalibus 5 cm. longis dense floratis, bracteis lanceolatis $1\frac{1}{2}$ -2 mm. longis, pedicellis 2-3 mm. longis desuper recurvis apice dilatatis. Sepala 5, exteriora 3, interiora 2, decidua ; supremum exteriorum sepalorum globosum saccatum majusculum rotundatum 3 mm. longum ; 2 inferiora exteriorum sepalorum late rotundata basi oblique leviter cordata $1\frac{1}{2}$ mm. longa ; 2 interiora petaloidea oblique obovata $7\frac{1}{2}$ mm.

longa 4 mm. lata apice rotundata, basi cuneata valde concava. Petala alte coalita, lateralia arete imbricata 8 mm. longa 2 mm. lata apice rotundata, medio plicato-reflexa basi oblique rotundata, carina latere interiore connata apice cristam 1½ mm. longam digitiformem gerens, digitis incrassatis. Ovarium glabrum breviter stipitatum (disco late annulari) rotundatum obovoidatum 2 mm. latum valde complanatum, margine subalatum. Stigma inaequale superne breve dentiforme apice punctiforme inferne subdilatatum concavum acutum. Stylus apice dilatus, infra stigma appendiculatus. Capsula ignota.

HAB. Montibus centralibus: Arisan, leg. S. SASAKI, Jan. 1911.

Near *P. arcuata* HAYATA and *P. nimborum* DUNN (in Fl. Kwangt. and Hongk. p. 39); but differs from the former by the larger light purple flowers and smaller leaves, and from the latter by the smaller leaves with very much fewer lateral veins.

Polygala stenophylla HAYATA sp. nov. Suffrut. scens. Caulis erectus rectus, simplex eramosus, toto longitudine foliatus, 30-40 cm. longus, gracilissimus, teres, 1 mm. in diametro sectionis, flavescens, glaber. Folia alterna, subsessilia, lanceolata linearia vel linearis-lanceolata, 3 cm. longa, 3 mm. lata, apice acuta vel obtusa, basi obtusa, suberecta utrinque glabra, membranacea, supra tenuissime reticulata, subtus pallida, petiolis brevibus 1 mm. longis vel brevioribus. Racemi simplices terminales 5-6 cm. longi, laxe florati, pedicellis 2-3 mm. longis basi 2-bracteatis, bracteis minutis ovatis 1 mm. longis. Sepala exteriora 3, subæqualia oblonga, 2½ mm. longa, valde concava, interiora obovata 5 mm. longa, 3 mm. lata, apice rotundata, basi subito cuneata obliqua ± concava. Petala lateralia ascendentia, oblonga 5 mm. longa, 1½ mm. lata, a medio ∞-forme contracta, basi cum carina coalita, supra basin libera, intus deorsum hirsuta, apice obscure 2-3-lobulata obliqua, carina sublibera basi unguiculata cum cristam 7 mm. longa 2½ mm. lata complete latere interiore connata, unguis 2½ mm. longis, laminis basi superne auriculatis, cristis 5-fidis, segmentis alte multi-fimbriatis. Stamina 8, vagina staminum lata, explicatio 1½ mm. lata 3½ mm. longa. Ovarium breve stipitatum obovoidatum, stigmata inaequalia, superius sessile, inferius late stipitatum, stipite complanato ¾ mm. longo, utrumque pectinatum.

HAB. Fökien: Kosan, leg. S. NAGASAWA, Aprili. 1910, (No. 226).

Near *P. hongkongensis* HEMSL. (Ind. Fl. Sin. I. p. 60, Pl. II.), but differs from it by the much narrower leaves and 2 distinctly lobed stigma; also near *P. tenuifolia*, but distinguishable from it in having broader leaves and terminal racemes.

Caryophylleæ.

Dianthus LINN.

Dianthus pygmæus HAYATA sp. nov. Herba nana 6-7 cm. alta, rhizomatibus gracilibus pauci-ramosis; caulis simplex, erectus, rectus. Folia radicalia ad basin caulis approximativi dense disposita, linearia 23 mm. longa 1½ mm. lata, apice acuta, basi longe attenuata in basi dilatata caulem semi-amplectantia, margine tenuissime marginata, et sub lente minute denticulata, sessilia. Folia caulinæ radicali similia, decussatim 3-seriatim remote sita, superioribus minoribus. Flores sub-sessiles erecti, basi bracteis oppositis 2-seriatim decussatis instructi, bracteis inferioribus ovatis apice longe cuspidatis 1 cm. longis 3½ mm. latis basi æquilatis margine hyalinis, superioribus oblongis apice breviore cuspidatis basi obtusis 12 mm. longis 5 mm. latis margine hyalinis. Calyx cylindricus, 18 mm. longus 3½ mm. latus, multi-striatus, ore 5-labatus, lobis triangulari-ovatis 4 mm. longis 2½ mm. latis leviter patentibus extus glabris intus pubescentibus margine breviter ciliolatis apice obtusis. Petala 5, longe unguiculata cum ungue 3 cm. longa, unguibus linearibus 17 mm. longis 1 mm. latis, lamina rotundato-ovata 13 mm. longa 12 mm. lata patento-reflexa a medio sursum alte fimbriata, (fimbriis saepe simplicibus, nunquam furcatis, 8 mm. longis basi ½ mm. latis omnino 10, radiatim divergentibus), basi cuneata integra. Stamina 10 basi in tubum brevem 1 mm. longum connata, supra basin libera, filamentis altris 6 mm. longis altris 4 mm. longis, antheris linearis-oblängis 1 mm. longis ½ mm. latis apice acete 2-lobatis basi sagittatis. Capsula (submatura) stipitata, stipite 1 mm. longo cum tubo staminum æquilongo, cylindracea 8 mm. longa 2½ mm. lata supra medium latissima glabra apice obtusa, cum stylo articulata, stylis 2, distinctis 9 mm. longis, linearibus intus hirtellis. Semina minuta.

HAB. In monte Morrison, ad 13000 ped. alt., leg. T. KAWAKAMI et U. MORI, 1908, Oct. (No. 2259).

Near *D. superbus* LINN., but differs from it in having much shorter calyx-tube and less fimbriate petals.

Silene LINN.

Silene Morii HAYATA sp. nov. Caulis plus 70 cm. altus, tetragonus facie leviter sulcatus hirsutus, ad nodos leviter prominulus. Folia lanceolata 4 cm. longa $\frac{1}{2}$ cm. lata, apice acuta, basi leviter angustata, æquata utraque pagine hirsuta, 3-nervia, nervis parallelis. Flores cymosi, pauciflorati, longe pedicellati, erecti, pedicellis $3\frac{1}{2}$ cm. longis. Calyx cylindrico-obconicus, 1 cm. longus apice 5 mm. latus extus hirsutus intus glaber 10-nervius apice 5-lobatus, lobis oblongis 3 mm. longis 2 mm. latis apice obtusis margine ciliatis intus glabris extus hirsutis. Petala 5, longe spatulata, 1 cm. longa, cum calice æquilonga, $2\frac{1}{2}$ mm. lata, apice latissima, 2-lobata, (lobis oblongis $1\frac{1}{2}$ mm. longis apice rotundatis 1 mm. latis basi æquilatis, sinibus interlobos obtusis), deorsum cuneato-attenuata, ad basin $\frac{1}{3}$ mm. lata, margine sursum integra, ad summum dentibus obtusis tenuibus 1- vel 2 utroque latere apicis instructa, deorsum integra a medio deorsum longe ciliata sursum non ciliata 3-nervia, sursum grosse reticulata. Stamina 10, 8 mm. longa, antheris oblongo-ovatis basi tenuiter lobatis $\frac{2}{3}$ mm. longis. Ovarium cylindricum, stylis 3 brevibus 2 mm. longis.

HAB. Jyōgesha, leg. U. MORI, 1910, Aprili.; Namshiseimansha, 1908, Mart.

Silene mushænsis HAYATA sp. nov. Caulis altus. Folia lanceolato-oblongo-ovata 5 cm. longa $1\frac{1}{2}$ cm. lata apice acuta basi attenuata in basi 4 mm. lata, utraque pagine hirsuta, costis et venis inconspicuis. Flores oppositim superpositim cymosi, pedicellis pubescentibus. Calyx cylindrico-oblongus, 8 mm. longus, apice 6 cm. latus, 10-nervius, extus pubescentis intus glaber, apice 5-lobatus, lobis patentibus reflexis triangularibus 2 mm. longis apice obtusis vel acutis margine ciliolatis. Petala 5 cuneato-ovata, 8 mm. longa, $3\frac{1}{2}$ mm. lata, apice tenuiter 4-lobata, (lobis 2 lateralibus obscuris, 2

centralibus $1\frac{1}{2}$ mm. longis apice obtusissimis), intus facie prope apicem supra medium obscure 2-squamata, basi cuneato-attenuata, 3-nervia. Stamina 10, petalis breviora, stylis 3.

HAB. Nantō: Musha, leg. U. MORI, Jan. 1908.

Differs from *S. Morii* HAYATA by the much broader leaves and 4-lobed petals. Also near *S. firma*, but distinguishable from it in having less emarginate petals and in the markings of seeds.

***Melandrium* ROEHL.**

***Melandrium morrisonmontanum* HAYATA sp. nov.** Perennis.

Rhizomata gracilia repentina, apice caules 5-6 gerentia. Caulis gracilis simplex teres subscandens, $\frac{1}{2}$ -1 mm. in sectionis diametro, brevissime hirsutus, toto longitudine foliatus. Folia linearia angustissima opposita $2\frac{1}{2}$ -3 cm. longa, $2\frac{1}{2}$ mm. lata, apice acuta, basi aequilata, caulem semi-amplectantia, in exsiccato utraque pagine minute tuberculata, costis supra impressis inconspicuis, subitus elevatis distinctis, venis et venulis inconspicuis, margine tenuissime marginata, ad marginem sub lente minute serrulata. Flores terminales, solitarii, pedicellis 6 mm. longis dense pubescentibus, pilis retrorsis, basi braeteis 2 instructis, bracteis foliaceis lanceolatis 13 mm. longis $2\frac{1}{2}$ mm. latis apice acuminatis utraque pagine glanduloso-punctatis margine ciliolatis, ciliis patentibus vel retrorsis. Calyx inflatus, breve cylindrico-campanulatus, 18 mm. longus apice latissime 12 mm. latus, basi interior intrudens 5 mm. latus, extus intusque praesertim ad nervos hirsutus, 5-nervius, et 5-internervis, tenuibus instructus, tenuiter semi-hyalinus, apice 5-lobatus, lobis triangularibus 5 mm. latis 4 mm. longis, versus apicem alis dilatatis margine apice ciliolatis deorsum non ciliolatis integris instructis, dorso apice costatis. Torus 4 mm. longus cum gynophora 6 mm. longus, gynophoris $1\frac{1}{2}$ mm. longis. Petala 5, longe unguiculata, cum unguibus 2 cm. longa, unguibus cum calyce aequilongis 12 mm. longis apice dilatatis laminiformibus obovatis deorsum linearibus, (partibus dilatis trinervis obovatis 5 mm. longis $4\frac{1}{2}$ mm. latis subito attenuatis ad linearem abeuntibus), deorsum linearibus $\frac{1}{2}$ mm. latis; laminis obcordatis grosse reticulatis 7 mm. longis quam ungue brevioribus apice 7 mm. latis a medio sursum furcatim 2-lobatis, (lobis oblongo-rectangularibus 4 mm.

longis $2\frac{1}{2}$ mm. latis apice obtusis, simibus interlobos acutis vel obtusis, lobis a se angulo 45° divaricatis basi æquilateralibus) basi cuneato-attenuatis, basi $1\frac{1}{2}$ mm. latis squamis 2 instructis, squamis oblongis rectangularibus 2 mm. longis 1 mm. latis basi æquilateralibus apice obtusis. Stamina 10, cum unguibus petalorum æquilonga. Ovarium oblongum, (gynophoris $1\frac{1}{2}$ mm. longis) $3\frac{1}{2}$ mm. longum 2 mm. latum, styli 3. Fructus ignotus.

HAB. Monte Morrison, leg. S. SASAKI, Oct. 1909.

Melandrium transalpinum HAYATA sp. nov. Perennis. Caulis cæspitosus ascendens, simplex 10 cm. altus toto longitudine foliosus, minute tuberculoso-hirsutus, ad nodos plus minus tumidus. Folia linearia internodium æquantia $1\frac{1}{2}$ cm. longa $1\frac{1}{2}$ mm. lata, apice acuminata, basi attenuata, cum eo opposito connata vaginam 2 mm. longam formantia, utraque pagine minute tuberculata, margine ciliolata. Calyx cylindrico-obconicus, 13 mm. longus, 1 cm. latus, erectus, basi interior intrusus, extus hirsutus intus subglaber, 5-nervatus, apice 5-lobatus, lobis triangularibus $3\frac{1}{2}$ mm. longis 4 mm. latis apice obtusis medio sursum margine ciliatis intus integris. Petala longe unguiculata, cum unguibus 16 mm. longa, (unguis 1 cm. longis sursum gradatim ad laminam abeuntibus, apice $3\frac{1}{2}$ mm. latis basi attenuatis cuneiformibus), lamina 7 mm. longa apice 6 mm. lata apice alte furcatim 2-lobata (lobis rectangularibus apice truncatis $3\frac{1}{2}$ mm. longis 2 mm. latis), basi leviter angustiore ad unguim abeunte vel ad basin contracta squamis 2 instructa, squamis late rectangularibus $2\frac{1}{2}$ mm. latis $1\frac{1}{2}$ mm. longis apice truncatis margine denticulatis. Stamina 10. Torus validus tementosus $2\frac{1}{2}$ mm. longus, gynophoris 10 mm. longis. Styli 4.

HAB. In montibus centralibus, leg. U. MORI et S. KATō, Dec. 1909.

Near *M. morrisonmontanum* HAYATA, but differs from it in having smaller leaves, broader petals and in its smaller form.

Melandrium vesiculiforme HAYATA sp. nov. Caulis basi prostrato-scandens, solum basi ramosus, ramis ascendentibus simplicibus, 30-40 cm. longis, cortice inferne minute tuberculato, sursum dense retrorse hirsutus, in toto longitudine foliatus. Folia opposita, linearia cum internodiis æquilonga,

5 cm. longa 2-2½ mm. lata, apice acuminata, basi leviter angustata cum eo opposito connata vaginam 2½ mm. longam formantia, utraque page minute tuberculata, margine ciliolata, costis subtus elevatis. Flores terminales, solitarii. Calyx inflatus, subglobosus, vel globoso-campanulatus, 1½ cm. longus totiusque latus, apice 5-lobatus, (lobis erectis triangularibus 7 mm. latis 5 mm. longis apice obtusis leviter dilatatis margine sursum dense ciliatis, deorsum nervoso-emarginatis non ciliatis integris), 5-nervatus tenuis, semi-hyalinus, utraque page præsertim ad nervos dense hirsutus, grosse reticulatus, basi interiore intrudens. Petala 5 longe unguiculata, cum unguibus 2 em. longa, (unguis 12 mm. longis calycem subæquantibus, longe lineariformibus apice 4 mm. latis deorsum sensim attenuatis basi 1 mm. latis medio trinerviis); lamina patente obcordata 8 mm. longa apice 7 mm. lata, apice alte furcatim 2-lobata, (lobis late oblongis 4 mm. longis totiusque latis apice rotundatis basi æqualibus grosse reticulatis) basi cuneata, basi usque ad 2 mm. in lato contracta, basi callis 2 globosis et supra eos squamis 2 instructa, squamis flabelliformibus 1½ mm. longis longitudinaliter plicatis, apice lobulatis. Stamina 5 cm. longa calycem æquantia. Torus 2½ mm. longus validus tomentosus, gynophoris 1 mm. longis hirsutis. Styli 4.

HAB. In Mt. Morrison, 12000 ped. alt., leg. S. SASAKI.

Near *M. morrisonmontanum* HAYATA, but differs from it by the longer leaves, much more swollen calyx and broader petals.

Arenaria LINN.

Arenaria petiolata HAYATA sp. nov. Herba tenuissima 10-20 cm. longa, prostrato-seandens. Caulis tenuiter et breviter retrorso-pubescent vel subglabrus. Folia opposita ovato-spathulata, subpetiolata, 12 mm. longa 5 mm. lata, apice obtusa, basi subito attenuata, ad petiolum 4 mm. longum abeuntia, tenuissima, utraque paree hirsuta, margine ciliata, petiolata, sed superiora subsessilia. Flores cymose subsolitarii, pedicellis 1 em. longis. Sepala inæqualia altra oblonga, altra lanceolata 4 mm. longa, 1-1½ mm. lata, dorso prominente costata, margine hyalina, altra ciliolata, altra non ciliolata. Petala 5 quam sepalis multo breviora oblonga brevissime unguiculata, 1½-1

mm. longa apice obtusa, inclusa. Stamina 10. Styli 3. Capsula oblonga 3 mm. longa, carpellis 3, apice bifidis.

HAB. Nanto, Mart. 1910, leg. T. KAWAKAMI.

Near *A. serpyllifolia* LINN., but differs from it by the petiolate leaves and very much smaller petals.

Sagina LINN.

Sagina echinosperma HAYATA sp. nov. Herba humilis; caulis foliifer erectus brevis a basi caulem floriferum emittens, omnino glaber. Folia caulis foliiferi linearis-filiformia erecto-patentia, 18 mm. longa, $\frac{1}{3}$ - $\frac{2}{3}$ lata, margine parce ciliolata basi cum iis oppositis connata. Folia caulis floriferi breviora 8 mm. longa. Flores cymose subsolitarii, pedicellis 2 cm. longis. Sepala 5, oblonga 3 mm. longa, 2 mm. lata, apice obtusa, 3-nervia, extus hirsuta, pilis glandulosis globuliferis, utrinque glanduloso-flavo-punctata. Petala 5, variabilis in magnitudine, oblonga, brevissime unguiculata, $2\frac{1}{2}$ mm. longa, $1\frac{1}{2}$ mm. lata, apice obtusa, basi acuta ad unguem brevem abeuntia. Stamina 5? Capsula subglobosa, carpellis 5, demum distinctis. Semina oblique globoso-oblonga $\frac{1}{2}$ mm. longa, testa tenui, minute et breve echinato-muricata.

HAB. Mt. Morrison, ad 9000 ped. alt., leg. S. SASAKI, Oct. 1909.

Near *S. Linnaei*; but differs by the very much thinner testa of the seeds and in other points.

Cerastium LINN.

Cerastium subpilosum HAYATA sp. nov. *C. pilosum* HAYATA Fl. Mont. Formos. p. 58, (non LEDEB.). Gracillima; caulis 30-40 cm. altus, tenuiter pilosus, pilis patentibus. Folia opposita, sessilia linearis-oblanceolata, $3\frac{1}{2}$ -4 cm. longa, 4 mm. lata, apice acuta, basi attenuata, supra parce aristato-pilosa, subtus glabra, pallida, margine remote ciliolata, costis supra tenuissime sulcatis subtus elevatis, venulis inconspicuis. Flores laxissime cymosi, pedicellis gracilis 1-2 cm. longis viscoso-pilosus. Sepala 5, ovato-oblonga, 2-3 mm. longa, apice obtusa, dorso et margine parce ciliata, integra, $1\frac{1}{2}$ mm. lata. Petala 5, linearis-spathulata, $3\frac{1}{2}$ mm. longa, $\frac{1}{2}$ - $\frac{3}{4}$ mm. lata, apice rotundata, basi attenuata. Stamina 5. Ovarium ovoidem $1\frac{1}{2}$ mm. longum, stylis 4-5. Capsula cylindrico-

globosa $3\frac{1}{2}$ mm. longa, 2 mm. lata, apice trunca, basi obtusa, ore 8-10-dentata, dentibus obtusis erectis. Semina oblongo-globosa leviter complanata, 1 mm. longa, rubescens, minute tuberculata.

HAB. Monte Morrison, 1908, leg. T. KAWAKAMI.

Near *C. pilosum*, but differs from it by the smaller less hairy leaves and in many other points. I fail to compare this to any other species of this genus.

Stellaria LINN.

***Stellaria arisanensis* HAYATA n. n.**

Cerastium arisanensis HAYATA Mater. Fl. Formos. p. 35, et Ic. Pl. Formos. p. 69, t. 13.

As is clearly seen from the construction of the fruits, the plant should be properly referred to *Stellaria*.

***Stellaria arisanensis* HAYATA var. *leptophylla* HAYATA n. v.** Folia majora, longe petiolata, ovato-rhomboidea, $2\frac{1}{2}$ cm. longa 17 mm. lata, apice acuta, ad summum breve aristata, basi subrotundata, ad extremitatem subito acuta et attenuata ad petiolum $1\frac{1}{2}$ cm. longum abeuntia. Flores similes cum typica.

HAB. Rontabunsan, leg. U. MORI.

Distinguishable from the type only by the much larger shape of the leaves. It may prove to be a summer form of the type when the habit is fully known.

***Stellaria uliginosa* MURR. ; MATSUM. et HAYATA Enum. Pl. Formos. p. 36.**

HAB. Arisan : Banzaisan, leg. B. HAYATA et S. SASAKI, Jan. 1912.

Hypericineæ.

Hypericum LINN.

***Hypericum formosanum* MAXIM. ; MATSUM. et HAYATA Enum. Pl. Formos. p. 41.**

HAB. Kusukusu, Mai. 1912, leg. B. HAYATA et S. SASAKI.

Hypericum geminiflorum HEMSL.; MATSUM. et HAYATA Enum. Pl. Formos. p. 41.

HAB. Loco non indicato, leg. U. MORI, Aug. 1912.

Guttiferæ.

Garcinia LINN.

Garcinia multiflora CHAMP. (Tab. IV.) MATSUM. et HAYATA Enum. Pl. Formos. p. 43; HAYATA Ic. Pl. Formos. I. p. 83. Frutex 2-3 m. alta, basi ramosissima, dense foliata. Ramuli recti glabri longitudinaliter sulcato-rungosi, glabri, viridescentes, divaricatae ramosi. Folia opposita, obovata vel obovato-cuneata, apice obtusa, basi cuneata, usque ad 8 cm. longa, $3\frac{1}{2}$ cm. lata, æquilateralia vel \pm obliqua, chartacea, vel chartaceo-coriacea, utraque glabra, in exsiccato subviridia concolora, supra glabra, sub microscopio minute lepidota, lepidibus minutissimis rotundatis, costis supra planis subtus elevatis, venis primariis supra obscure subtus distinete elevatis utroque latere costæ 10-11 subrecte vel \sim formiter curvatis angulo 30°-40° a costa divaricatis prope marginem per nervum marginalem contextis, petiolis angustissime subalatis $1\frac{1}{2}$ cm. longis supra planis tenuissime sulcatis subtus convexis. Flores dioecii; corymbi $\hat{\jmath}$ terminales subpaniculati 5 cm. longi 3-4 cm. lati dichotome ramosi, (rhachidibus ad ramificationem peltato-annulariter tumidis utroque latere stipuliferis, stipulis minutissimis cuspidiformibus), pedicellis 7 mm. longis basi bracteis 1 instructis, bracteis triangularibus deciduis cuspidiformibus $\frac{1}{2}$ mm. longis. Sepala 4 valde concava, imbricata, chartacea, rotundata, 2-exteriora majora 8 mm. longa, 2-interiora \pm minora 7 mm. longa rotundata basi contracta paralleliter multinervia, nervis circ. 10. Petala 4, obovato-cuneata, 11 mm. longa, 9 mm. lata, apice latissima rotundata, infra apicem usque ad basi recto-cuneata, basi 1 mm. lata, alba, divaricato-multinervia, subreticulata. Stamina 4, filamentis validiuseulis rectis 4 mm. longis apice rotundato dilatatis antheriferis, antheris ∞ sessilibus 2-loocularibus. Rudimentum ovarii columnare, subcomplanatum, apice peltato-dilatatum, botrioideo-tuberculatum.

HAB. Kusukusu prope Botansha, leg. B. HAYATA et S. SASAKI, Juni. 11, 1912.

This very rare and handsome tree was for the first time in June last year collected by Mr. S. SASAKI and myself, in my last journey to the island. It was found on a crag by the mountain pass from Kusukusu to Botansha, which was quite an unbeatened track for any one except for savages. The flowers have a so close resemblance in its external feature to those of *Euonymus* that I was led to mistake the plant for one of the Celastrus-family. It was first recorded from the island by Dr. A. HENRY. So far as I can judge from the description given in BENTH. Fl. Hongk. p. 25, the present plant may be identical with this species.

Ternstroemiacææ.

Anneslea WALL.

Anneslea fragrans WALL. var. **lanceolata** HAYATA n. v. (Tab. V.)
 Arborescens. Rami et rami validi cinerascentes rugosi glabri. Folia lanceolata, oblongo-lanceolata vel interdum obovato-lanceolata, 10-12 cm. longa, 3 cm. lata, apice subito acuta ad summum obtusa, basi acuta ad extremitatem attenuata ad petiolum abeuntia, utraque pageine glabra, supra nitida subitus pallida opaca sub lente parce punctata, costis supra impressis subtns elevatis, venis utraque pageine inconspicuis non visis, margine desuper recurvata integerrima, coriacea, in exsiccato fusco-flavescentia, petiolis 2-3 cm. longis teretibus supra non sulcatis sursum \pm obscure subalatis basi ad insertionem leviter obscure peltato-dilatatis. Flores versus apicem ramulorum brevissime racemose dispositi vel quasi-axillares, ad axillam folii solitarii, longe pedicellati, cernui vel penduli, pedicellis circ. 3 cm. longis petiolum in longitudine superantibus desuper recurvis glabris plus minus complanatis vel alatis apice latioribus cum alis 4 mm. latis apice sub flore 2-bracteatis, bracteis oppositis ovatis 5-6 mm. longis 4-5 mm. latis apice truncatis vel emarginatis ad centrum mucronatis basi vix contractis crassis dorso carinato-alatis (carinis $\frac{1}{2}$ mm. latis apice ad mucronem attingentibus), margine

eroso-denticulatis ad apicem dentium \pm glanduloso-crassatis. Sepala 5, valde imbricata, semi-patentia, ovata vel rotundata, 1-1½ cm. longa, sursum margine introrse valde recurva, apice acuta basi rotundata contraeta ad insertionem 3 mm. lata, utraque pagine glabra, crassiuseula, versus marginem tenuiora ad marginem tenuissima hyalina margine integra vel ciliata. Petala 5, 14-17 mm. longa basi alte in tubum 6 mm. longum connata, partibus liberis obovatis 10 mm. longis medio 6 mm. latis apice acuto-triangularibus basi cuneatis contractis 2-3 mm. latis ad basin utroque latere 1-auriculatis, auriculis obtusis vel obsoletis, partibus connatis vel tubis 6 mm. longis, partibus liberis tenuissimis, partibus connatis minus tenuibus multinerviis, nervis parallelis ad basin partis liberæ convergentibus sursum et deorsum divergentibus ad utraque extremitatem petalorum \pm convergentibus, utraque pagine glabra. Stamina ∞ cire. 40, 1- (vel 2?) seriatim disposita, glabra petalis paullo breviora, 13 mm. longa inclusa, filamentis 5 mm. longis complanatis crassiuseulis $\frac{2}{3}$ mm. latis, antheris adnatis basifixis linearibus 4-5 mm. longis 1½ mm. latis introrse dehiscentibus basi cordatis apice aenatis connectivis apice in appendiculum longe productis, appendiculis linearibus apice acuminatis 3-4 mm. longis anthera paullo brevioribus. Ovarium semi-inferius vel semisuperius, late conicum 4 mm. latum, supra calycem brevissime exsertum, apice ad stylum abeuns, triloculare, loculis 3-ovulatis, ovulis e sumnum loculorum pendulis, stylo filiformi 1½ em. longo apice brevissime 3-lobato, lobis cire. 1 mm. longis apice aenatis intus suleatis.

HAB. Huiransan, prope Kusukusu, leg. B. HAYATA et S. SASAKI, 1912, Juli.

Very like the type, but differs from it in having narrower leaves and two larger bracts immediately below the calyx. Through the courtesy of Mr. E. D. Merrill of the Philippines, I was able to find a proper genus to which this plant should be referred. Very remarkable for its petals united to the middle.

Adinandra JACK.

Adinandra hainanensis HAYATA sp. nov. Rami fuscentes. Folia obovato-oblonga, coriacea, 10 cm. longa, 4½ cm. lata, apice breve cuspidato-acuta, ad sumnum obtusa, basi acuminata, (costis supra tenuiter impressis, subtus

elevatis, venis et venulis utraque pagine elevatis reticulatis), margine minute serrulata, petiolis 1 cm. longis intus subplanis extus rotundatis. Flores axillares solitarii pedicellati, pedicellis $1\frac{1}{2}$ cm. longis recurvis, bracteis 2-3 instruetis. Sepala fructifera 5 valde imbricata ovata apice acuminata, extus sericeo-pubescentia, intus glabra, 7-8 mm. longa, 6 mm. lata. Fructus subglobosi, apice extus sericeo-pubescentes apice rostrati, rostris 2 mm. longis cum stylo articulatis, stylis persistentibus adpresse sericeo-pubescentibus.

HAB. Hainan, leg. N. KONISHI, Juni. 1909, (No. 5).

Near *Adinandra lasiostyla* HAYATA, but differs from it by the serrulate leaves.

Adinandra hypochlora HAYATA sp. nov. Rami fuscentes. Folia obovato-oblonga, tenuiter coriacea, maxima 9 cm. longa $3\frac{1}{2}$ cm. lata, apice breve acuminata, vel acuta, basi \pm attenuata vel acuminata, in exsiccatu supra fuscentia subtus flavescentia, costis supra impressis subtus elevatis, venis et venulis supra elevatis subtus tenuissime elevatis distinctis interdum inconspicuis, margine supra medium serrulata vel vix serrulata, deorsum integra, petiolis 5-6 mm. longis intus late sulcatis. Flores ignoti. Baecæ axillares, solitariae, (pedicellis 2 cm. longis apice \pm incrassatis), globosæ 1 cm. in diametro, adpresse pubescentes apice apiculatae. Sepala fructifera oblonga, glabra persistentia 8 mm. longa, 4 mm. lata, apice obtusa, dorso medio costata, coriacea, margine tenuia, remote serrulata vel subintegra.

HAB. Tōkō, leg. Y. KIKUCHI, Aug. 1912.

Near *Adinandra lasiostyla* HAYATA, but differs from it in having quite glabrous sepals.

Thea LINN.

Thea gnaphalocarpa HAYATA sp. nov. Frutex, rami graciles, cortice fuscenti longitudinaliter fisso demum soluto, ramulis sursum pilosis. Folia obovato-oblonga, coriacea, breve petiolata maxima, $4\frac{1}{2}$ cm. longa, 2 cm. lata, apice obtusa vel breve acuta, basi cuneata vel acuta, margine serrulata (ad summum serrularum apiculata), margine \pm desuper recurva, utraque glabra, supra nitida, subtus pallida, costis venis et venulis utraque pagine elevatis,

interdum inaequale, petiolis 4 mm. longis tenuissime hirsutis intus late sulcatis. Flores axillares vel pseudo-terminales, solitarii vel gemini, sessiles, alabastro oblongo 8 mm. longo apice acento. Sepala 5-10, decidua, extus hirsuta, inaequalia, (extimum minimum, intimum maximum) rotundata, maxima 8 mm. in diametro valde concava intus glabra. Petala 5, basi distineta, inaequalia exteriora latiora breviora rotundato-cuneata 12 mm. longa 10 mm. lata apice emarginata, interiora longiora angustiora 2 cm. longa 7 mm. lata apice 2-lobata, (lobis 3 mm. longis apice obtusis), basi angustata cuneata, basi utraque pagine glabra vel sursum extus \pm hirsuta. Stamina numerosa circ. 1 cm. longa, exteriora usque ad medium connata, interiora paucia distineta tota glabra, filamentis apice liberis tenuibus, antheris rotundato-reniformibus 1 mm. latis. Ovarium dense sericeo-pilosum globosum 2 mm. longum, stylis 3 usque ad apicem connatis 3 mm. longis.

HAB. Karapim, leg. S. SASAKI, 1910, Dec.

Very near *T. Sasamqua* MIQ., but differs from it in having much smaller flowers and smaller leaves. It may prove to be a variety of the latter, when the habit is fully known. Here is another specimen from Fokien resembling very much this plant, and it may probably be the same species.

Thea parvifolia HAYATA sp. nov. (Tab. VI.) Frutex? ramosi, ramis gracilibus, cortice cinerascenti longitudinaliter soluto, ramulis apice patentopilosis. Folia coriacea rhomboideo-oblonga rhomboideo-lanceolata vel \pm ovata, 3 cm. longa 11 mm. lata, apice acuminata ad summum obtusa, basi cuneata, margine ascendento-serrulata versus basin integra, utraque pagine glabra, costis supra hirsutis subtus glabris, petiolis 4 mm. longis intus late sulcatis, venis et venulis non conspicuis. Flores ad apicem ramulorum pseudo-terminales solitarii brevissime racemosi 2 cm. in diametro, pedicellis 4 mm. longis vel 0 multi-bracteatis pubescentibus, bracteis inerioribus late triangularibus superioribus majoribus. Sepala 5-6, late rotundata, interiora majora 3 mm. lata 2 mm. longa extus pubescentia intus glabra margine ciliata. Petala 5 basi in tubo 3 mm. longo connata, valde inaequalia, rotundata vel oblonga, 10-12 mm. longa, altra crassiuscula extus hirsuta intus glabra, altra tenuia utraque pagine glabra apice rotundata. Stamina

numerosa, 1 cm. longa, intima 5 libera, exteriora alte connata, tubum formantia, tubo cum petalis adnato, filamentis parte libera incrassatis versus apicem tenuissime filiformibus, antheris triangularibus, loculis basi sagittato-divergentibus. Ovarium globosum apice ad stylum abeuns sericeo-tomentosum, stylo filiformi 13 mm. longo sericeo-pubescenti apice 3-fido, ramis 1 mm. longis.

HAB. Mt. Randaisan, leg. U. MORI, Mart. 1908, (No. 3549).

Near *T. lutchuensis* ITO; but differs from it by the much smaller and acuminate leaves.

Dipterocarpeæ.

Ancistrocladus WALL.

Ancistrocladus hainanensis HAYATA sp. nov. Rami teretes, fuscentes, glabri, lèves, lenticellis linearibus notati, ramulis unciferis, uncis semi-circularibus validis. Folia variabilima alterna, chartacea vel chartaceo-coriacea, oblonga, oblongo-ovata, obovato-lanceolata, 40-6 cm. longa, 10-3 cm. lata, apice rotundata vel obtusa, basi attenuata spathulata sessilia, a basi 5-6 mm. lata, margine integra, utraque pagine sub lente minute albo-lepidoto-punctata, (lepidibus rotundatis margine lobulatis), et sub lente minute parcoque impresso-punctata, costis supra impressis, subtus elevatis, venis utraque tenuiter elevatis, venulis tenuissimis reticulatis, margine integra. Flores spicato-panieulati, panieulis terminalibus, floribus spicatim dispositis, panieulis 10 cm. longis 8 cm. latis, sub floribus singulis 1-bracteatis, bracteis minutis 2 mm. longis oblongo-triangularibus margine serrulatis. Sepala 5, basi connata, 6 mm. longa, intus lepidota, oblonga, imbricata, glabra. Petala 5, imbricata, oblonga, 4½ mm. longa, apice rotundata, glabra, intus lepidota. Stamina 10, ad basin petali affixa, 1½ mm. longa, antheris subeordatis apice emarginatis basi cordatis ½ mm. longis, loculis divaricatis, filamentis basi ± dilatis. Ovarium inferius 1-loculare 1-ovulatum, ovulis amphitropis, stylo 3-fido, ramis 1½ mm. longis apice valde oblique dilatis. Calyx fructifer valde aereascens, tubus 5 mm. longus, lobis inæqualibus, majoribus obovato-spathulatis 4 cm. longis 2 cm. latis basi

3 mm. latis elevato-reticulato-venosis, minoribus 2½ cm. longis. Fructus calyeis tubo adnatus turbinatus vertice subplanus, calyeis laciis alæformibus cinctus. Semen subglobosum, albumen ruminatum.

HAB. Hainan, leg. Z. KATSUMADA, 1909.

Sterculiaceæ.

Sterculia LINN.

***Sterculia luzonica* WARB. ; MERRILL Fl. Manila p. 327.**

OBSERV. Folia alterna oblongo-cordata 11 cm. longa 7 cm. lata, apice subito acuminata ad summum obtusa, basi cordata chartacea vel tenuiter coriacea, margine integerrima, utraque pagine glabra, basi 5-7 nervia, venis lateralibus utroque latere 6 a costa angulo 50° egressis, petiolis 3 cm. longis teretibus. Folliculi gemini divaricati vel solitarii, breve stipitati, apice brevissime rostrati breve villoso-pubescentes rugulosi, oblique semi-globosi, 4-5 cm. longi 3 cm. lati, inflati, extus in exsiccato fusco-flavescentes, intus subrubescentes, valvis incrassatis lignosis. Semina in carpellis singulis 2, ellipsoidea 18 mm. longa 11 mm. lata, utrinque obtusa vel rotundata, tenuissime latere compressa, testæ exocarpium tenuiter chartaceum subnitidum nigricans ± obscure et tenuissime striatum, mesocarpium pulveraceum, endocarpium chartaceum nitidum nigricans.

HAB. Kōtōshō, leg. U. MORT et S. SASAKI, 1911, April.

This somewhat differs from the type in having acuminate leaves and much thinner broader carpels.

Tiliaceæ.

Triumfetta LINN.

***Triumfetta semitriloba* LINN. ; MASTERS in HOOK. f. Fl. Brit. Ind. I. p. 396 ; MERRILL Fl. Manila p. 314.**

HAB. Karapin, Jan. 1912, leg. B. HAYATA et S. SASAKI.

DISTRIB. India and the Philippines.

Malpighiaceæ.

Ryssopteris BLUME.

Ryssopteris Cumingiana A. JUSS. in VIDAL Phanerog. Cnsm. Philipp. p. 99.

HAB. Kōtōshō, leg. T. KAWAKAMI et S. SASAKI, Juli. 1912.

Determined by Mr. T. KAWAKAMI at Manila in his trip to the Archipelago.

Hiptage GERTN.

Hiptage leptophylla HAYATA sp. nov. Rami fusco-purpurascentes vel fuscentes, recti, graciles. Folia opposita membranacea, ovata vel ovato-oblonga, rarius obovata, maxima 8 cm. longa 4 cm. lata, apice abrupte acenta vel apiculato-acuta, basi late emarginata vel rotundato-acuta, costis venis et venulis utraque paginae tenuissime elevatis distinctis, supra glabra, subitus ad et prope costam adpresso hirsuta, petiolis 5 mm. longis adpresso hirsutis. Racemi axillares vel terminales, oppositi, plerumque ad axillas gemini, 5-6 cm. longi dense vel laxe florati, rhachidibus et pedicellis adpresso pubescentibus, bracteis subulato-lanceolatis 2-3 mm. longis, pedicellis 5-10 mm. longis. Sepala 5, inæqualia oblonga vel oblongo-rectangularia, apice rotundata, basi æquilata, circ. 4 mm. longa 2½ mm. lata, extus adpresso pubescentia intus glabra, sed basi hirsuta. Petala 5 rotundato-oblonga, 13 mm. longa 9 mm. lata, apice rotundata, basi brevissime unguiculata, (unguis angustissimis ⅓ mm. latis 2 mm. longis) extus adpresso hirsuta intus glabra margine fimbriata multinervata. Stamina 10, declinata, omnia fertilia, unum ceteris multo majus. Stylus 1 filiformis primum circinnatus, stigmate capitellato rarius truncato.

HAB. Tandaisha, Jyōgesha, leg. U. MORI, Aprili. 1910.

Near *H. Malablotia* GERTN.; but differs from it in having much shorter racemes, smaller flowers and very much thinner and smaller leaves. It differs also from *H. obtusifolia* DC., by the ovate acute leaves.

Rutaceæ.

Xanthoxylum LINN.

Xanthoxylum ? pistaciiflorum HAYATA sp. nov. Rami recti, cortice rubro-fuscenti, lenticellis elevatis subpeltatis 2-lobatis notati. Folia alterna trifoliolata, in ambitu triangulari-rhomboidea, foliolo terminali maximo obovato-oblongo $6\frac{1}{2}$ em. longo 27 mm. lato apice obtuso ad summum retuso basi attenuato ad petiolulum $\frac{1}{2}$ em. longum abeunti tenuiter coriaceo basi integro supra basin usque ad apicem tenuissime breve crenato-serrato, serris brevisimis, costa supra impressa vel elevata subtus elevata, venis lateralibus tenuissime distincte elevatis rectis prope marginem fureatis, supra nitida, subtus non nitida, petiolulis subalatis, foliolis lateralibus minoribus dimidium terminalis æquantibus, petiolis communibus 2 em. longis subteretibus intus sulcatis vel angustissime alatis. Flores ♂: paniculati, paniculæ axillares 3 em. longæ laxe floratæ, pedicelli 2-3 mm. longi basi 1-brakteati, bracteis spathulato-linearibus $\frac{1}{2}$ mm. longis apice ciliato-fimbriatis. Sepala 5, spathulato-linearia, 14 mm. longa. $\frac{1}{3}$ mm. lata, apice obtusa, glabra. Petala 0. Stamina 5, sepalis opposita, sepalis longiora $1\frac{1}{2}$ mm. longa, antheris late cordatis introrsis apice obscure apiculatis. Rudimentum ovarii minutum globoso-pyramideum.

HAB. Akō: Bongarisha, leg. G. NAKAHARA et SASAKI.

Somewhat resembles *Z. ovalifolium*, but greatly differs in the floral structure.

Xanthoxylum pteropodum HAYATA sp. nov. Rami subrecti, glabri, ut videntur enermes. Folia imparipinnata, in ambitu obovato-lanceolata, 24 cm. longa 8 cm. lata, 21-17 foliata, foliolo terminali longissime lanceolato 6-7 cm. longo $1\frac{1}{2}$ em. lato apice acuminato basi cuneato-acuto chartaceo, (costa supra impressa subtus elevata), supra fuscenti subtus pallidissimo, (venis lateralibus supra non visis subtus tenuissime distinctis elevatis), margine tenuiter crenulato-serrato, ad sinus inter serras calloso-punctato, non petiolato, foliolis lateralibus superne majoribus inferne minoribus eo terminali

conformibus sed multo minoribus, iis basirabilibus minimis oblongis apice obtusis basi acutis brevissime petiolulatis, petiolis communibus 15 cm. longis, angustissime alatis intus planis semiteretibus. Paniculæ ♀ terminales folio multo breviores 4–5 cm. longæ, bracteis minutis lanceolatis $\frac{1}{3}$ mm. longis. Carpella matura globosa, 3 mm. in diametro; semina nitida.

HAB. Arisan, leg. G. UYEMATSU, 1912.

Near *X. piperitum* DC., but differs from it in having winged common petiols and acuminate leaflets.

Fagara LINN.

Fagara laxifoliolata HAYATA, sp. nov. Scandens? Rami subrecti, brevissime remoti aculeati, aculeis 1–2 mm. longis desuper recurvis acutis, cortice fuscenti ruguloso superne minute parceque lenticellato. Folia alterna, in ambitu ovata 20–25 cm. longa 12 cm. lata, impari-pinnata laxe foliolata, pinnis 11–13, foliolo terminali maximo obovato-oblongo 8 cm. longo $3\frac{1}{2}$ cm. lato apice longe enspidato ad summum obtuso basi subito attenuato ad petiolulum abeundi chartaceo chartaceo-coriaceo margine subintegro supra nitido, costa supra impressa subtus elevata, venis rectis utraque pagine tenuiter distinete elevatis), petiolulo circ. 2 cm. longo, foliolis lateralibus terminali minoribus breve petiolulatis, iis basilaribus 4 cm. longis basi \pm obliquis, petiolulis $\frac{1}{2}$ cm. longis, petiolis communibus 15 cm. longis teretibus supra sulcatis gracilibus. Paniculæ ♀ axillares 5–7 cm. longæ. Fl. ♀: pedicellis 2–3 mm. longis tenuissime pubescentibus basi 1-bracteatis, bracteis triangularibus $\frac{2}{3}$ mm. longis obtusis. Calyx 4-partitus, sepalis triangularibus obtusis 1 mm. longis incrassatis, margine tenuissimis. Petala 4, imbricata, ovata, 3 mm. longa 2 mm. lata, apice obtusa, crassiuscula, margine tenuia sub lente minute denticulata. Rudimenta staminum 4. Carpella 4 cum stylo reflexo rostrata.

HAB. Shichiseitonzan, leg. Y. SHIMADA, Aprili. 1911.

Near *F. Avicennæ* DC., (BENTH. Fl. Hongk. p. 58); but differs from it in having flowers with four carpels and cuspidate leaflets.

Murraya LINN.

Murraya *omphalocarpa* HAYATA sp. nov. Frutex?; rami glabri, cinerascentes. Folia alterna pinnata 3-5-foliolata, foliolo terminali majore obovato 7 cm. longo 4 cm. lato apice cuspidato breve acuto ad summum obtuso vel retuso basi cuneato-acuto coriaceo, (costa supra late sulcata subtus elevata, venis utraque pagine tenuiter elevatis utroque latere 7-8 rectis apice fureato-ramosis), in exsiccato utraque pagine pallido margine subintegro vel remote vel obscure crenato, petiolulo brevissimo 3 mm. longo intus sulcato, foliolis lateralibus alternis terminali conformilis sed minoribus, petiolis communibus 5-6 cm. longis intus planis extus convexis. Flores pseudo-umbellati, umbellis quasi-terminalibus sessilibus 5-6-radiatis, radiis 1-1½ cm. longis, floribus 1½ cm. longis. Calyx basi campanulatus alte 5-partitus, sepalis oblongo-linearibus 2½ mm. longis 1½ mm. latis apice crassiuseulis tenuiter pubescentibus. Petala 5, oblongo-lanceolata 23 mm. longa 8 mm. lata, apice obtusa vel acutiuscula, basi attenuata, basi 1 mm. lata margine deorsum integra sursum crenulato-repanda. Stamina 10, altra longiora 14 mm. longa, altra 11 mm. longa, filamentis complanatis, antheris reniformibus utrinque emarginatis. Discus incrassatus pulviniformis. Ovarium oblongo-cylindricum eire. 3 mm. longum 1 mm. latum, subglabrum vel basi tenuissime hispidum, basi ad stipitem brevem attenuatum, apice ad stylum abeuns, stylo 1 em. longo glabro, stigmate subpeltato integro vel obscure 2-lobato. Bæcca ovoidea 2 em. longa, 1-1½ em. lata, rubra, longe rostrata, basi contracta ad stipitem brevem 1-2 mm. longum abeuns, 2-locularis, loculis 1-spermis, pericarpio rubro glanduloso-punctato crasso. Semina oblonga, tenuiter complanata, 12 mm. longa, dense fibroso-barbata, barbis 7 mm. longis, testa tenui, cotyledonibus oblongis, radicula minutissima.

HAB. Kōtōshō et Kwashōtō.

Near *M. exotica*, but differs from it by the larger rostrate fruits and petals with attenuate base.

Meliaceæ.

Chisocheton BLUME.

Chisocheton kusukusense HAYATA (Tab. VII.) Frutescens vel arborescens. Rami cortice fusco-rubescenti. Folia pinnata ampla 35 cm. longa vel longiora pari- vel impari-pinnata membranacea vel chartacea 7-8-foliolata in ambitu obovata, foliolis oblongis vel ovatis vel ovato-oblongis 8-15 cm. longis 5-3 cm. latis apice acutis ad summum obtusis basi acutis vel obtusis vel rotundatis utrinque glabris, (costa supra plana subitus elevata, venis lateralibus supra planis inconspicuis subitus tenuiter distinete conspicuis, venis secundariis non visis), breve petiolatis. Panicleæ axillares erectæ laxè floratae foliis breviores, pedicellis 1-½ em. longis hirsutis multi-bracteatis, bracteis triangularibus 1 mm. longis acutis hirsutis, pedicellis infra ealyceum artieulatis. Calyx campanulatus hirsutus 4-dentatus, dentibus latissimis brevissimis. Petala 4, erecto-patentia extus hirsuta intus glabra valvata, angusta 8 mm. longa 2-2½ mm. lata, basi sensim angustiora, apice obtusa inerassata, margine tenuia, basi æquilata. Tubus staminalis 6½ mm. longus 3½ mm. in diametro, apice margine integer, glaber, prope apicem interiore antheras sessiles gerens, antheris 8 oblongo-linearibus. Discus tubuliformis ovarium amplectans apice hirsutus. Ovarium conicum 1 mm. longum apice ad stylum abeuns, stylo recto cum tubo staminali æquilongo, stigmate late peltato, pelta rotundata 1 mm. in diametro.

HAB. Hieranzan, leg. B. HAYATA et S. SASAKI, Juli. 1912.

Near *C. hongkongensis* TUTCHER (Journ. Linn. Soc. XXXVII. p. 64), but differs from it by the larger 4-merous flowers.

Aglaia LOUR.**Aglaia formosana** HAYATA n. n.

Aglaia elaeagnoides BENTH. var. *formosana* HAYATA in MATSUM. et HAYATA Enum. Pl. Formos. p. 78.

Ilicineæ.

Ilex LINN.

Ilex cleyeroides HAYATA sp. nov. Ramuli glabri fuscentes vel fuscocubrescentes non lenticellati. Folia alterna glaberrima, coriacea, obovato-oblonga vel obovato-lanceolata, 8 cm. longa, 3 cm. lata, apice subito-acuta vel breve cuspido-acuta, ad summum obtusa vel tenuiter retusa, (costis supra tenuiter impressis sulcatis, subitus elevatis venis et venulis utraque paginae tenuiter elevatis), in exsiccato utraque pallida sed subitus pallidissima, margine integra, tenuissime recurvata, petiolis laminam $\frac{1}{6}$ -plo æquantibus 8 mm. longis incrassatis intus profunde sulcatis extus minute transversim rugulosis. Fructus ad axillas foliorum 5-6 longe pedicellati, pedicellis petiolum 2-plo superantibus erectis. Calyx fructifer patens 1 cm. longus 5-lobatus, lobis late triangularibus 2 mm. latis 1 mm. longis apice obtusis denticulatis deorsum integris. Fructus depresso-globosi 6 mm. lati.

HAB. Formosa, loco non indicato.

Near *I. memecylifolia* CHAMP.

Ilex glomeratiflora HAYATA sp. nov. Rami graciles recti glabri longitudinaliter rugulosi pallidi. Folia concolora virido-pallidissima in exsiccato, oblongo-lanceolata 9 cm. longa 28 mm. lata, chartacea vel tenuiter coriacea, apice longe acuminata vel caudato-acuminata (acuminibus 1 cm. longis $1\frac{1}{2}$ mm. latis) basi aenta vel cuneato-acuta utraque glabra, margine subintegra vel obscure serrulata, (serrulis interdum obsoletis), margine plana non recurvata costis supra sulcatis subitus elevatis, venis lateralibus supra inconspicuis subitus tenuissime elevatis utroque latere 8-10, ~formiter recurvis, petiolis gracilibus laminam $\frac{1}{3}$ -plo æquantibus supra sulcatis. Flores ♂: ad axillas glomerati, pedicellis $1\frac{1}{2}$ mm. longis glabris basi bracteis instructis, bracteis oblongis obtusis $\frac{2}{3}$ mm. longis margine ciliolatis. Calyx 4-lobatus, lobis rotundatis extus parvissime brevissimeque hirsutis margine ciliolatis $\frac{2}{3}$ mm. longis. Corolla subrotata generaliter 4-lobata, tubo $\frac{1}{2}$ mm. longo, lobis oblongis $2\frac{1}{2}$ mm. longis $1\frac{1}{2}$ mm. latis apice obtusis basi ±

contractis valde concavis reflexis patentibus margine integris glabris. Stamina 4, longe exserta, ad fauem tubi corollæ affixa, filamentis lobo corollæ longioribus 3 mm. longis complanato-filiformibus patentibus, antheris ovato-cordatis $\frac{2}{3}$ mm. longis apice obtusis. Rudimentum ovarii subconicum 4-sulcatum.

HAB. Arisan, leg. S. SASAKI, 1910, Mart., (Fl.).

Near *I. formosana* MAXIM., but differs from it by the more acuminate, thinner and subentire leaves.

Ilex Hanceana MAXIM. in Mém. Acad. Sc. Pétersb. 7e Série, XXIX. (1881), p. 33.

Ilex goshiensis HAYATA Mater. Fl. Formos. p. 54.

Ilex kelungensis LOES. Monogr. Aquifoliae. p. 335.

Near *I. formosana* MAXIM.

Ilex lonicerifolia HAYATA sp. nov. (Tab. VIII.) Ramuli veteriores subteretes pubescentes, cortice fuseenti lenticellato, novelli triquetri, angulis acutis, viloso-pubescentes, pilis fuseentibus. Folia alterna elliptica, ovato-vel obovato-elliptica, 6 em. longa 3 em. lata, apice acuta vel obtusa, basi obtusa, supra dense subtus tenuiter brevissime pubescentia, in exsiccatu supra fuseentia subtus pallida, chartacea vel tenuiter coriacea, costis supra planis vel tenuissime elevatis vel impressis dense pilosis, subtus distinete elevatis dense pilosis, venis lateralibus primariis utroque latere 9-10 mediis angulo 60° a costa divaricatis tenuissimis supra vix elevatis subtus haud elevatis vel tenuissime impressis distinctis rectis prope marginem furcatim anastomosantibus, margine manifeste recurvata, basi plicato-recurvata, integerrima, petiolis 6-7 mm. longis dense fusco-villosis supra sulcatis, pulvinis elevatis. Flores subumbellati, umbellis axillaribus pedunculatis, pedunculis fusco-pubescentibus 18 mm. longis pedicello longioribus triquetris, bracteis elongato-triangularibus, pedicellis cire. 1 em. longis. Flores patentes 6-7 mm. in diametro, 5-6-7-meri. Calycis lobi 5-7, lobis imbricatis extus pubescentibus intus glabris rotundatis 1-1½ mm. in diametro basi leviter contractis margine ciliatis. Corolla patens

6-7 mm. in diametro 5-lobata, lobis 5 oblongis $2\frac{1}{2}$ mm. longis 2 mm. latis apiee rotundatis basi \pm contractis margine integris. Staminodia 5, ad fauem corollæ inserta, filamentis dilatatis $\frac{1}{2}$ mm. longis, antheris late sagittato-triangularibus apice obtusis basi late obtuse sagittatis. Ovarium globosum cum stigmate 2 mm. longum, stigma sessile subconicum 5-lobatum vel 5-sulcatum apicem ovarii coronans. Ovarium 5-locreare, loculis 1-ovulatis, ovulis pendulis anatropis.

HAB. Pokupokusha, leg. U. MORI, Juli. 1912, Fl. ♀.

Nothing like this in Chino-Japanese flora. Somewhat near *I. organensis* LOES. Monogr. t. IV. fig. 3, in appearance.

***Ilex Maximowiczii* LOES.** Monogr. Aquifoliac. p. 339.

HAB. Liukiu: Yaeyama.

***Ilex micrococca* MAXIM. var. *longifolia* HAYATA** n. v. (Tab. IX.)
 Rami veteriores glabri cinerascentes longitudinaliter rugosi leaticellati (lenticellis rotundatis utraque extremitatem cuspidatis), ramulis novellis fusco-rubescens in longitudinaliter rugosis glabris nitidis lenticellatis. Folia alterna, ovato-oblonga, oblongo-lanceolata, 10-12 cm. longa, 3-4 cm. lata, apice longe acuminata, basi cuneato-acuta, obtusa, nunquam rotundata, chartacea, supra nitida subtus pallida, in exsiccato supra fulvo-rubescens subtus fulvo-flavescens, (costis et venis rubescens-coloratis, costis supra impressis sulcatis subtus elevatis, venis lateralibus supra tenuissime elevatis subtus distinete elevatis, venulis supra reticulatis tenuiter elevatis), margine tenuiter remote serrulata, serrulis longe aristatis, petiolis gracillimis recurvo-reflexis fusco-rubescens in exsiccato valde rugulosis intus sulcatis laminam $\frac{1}{2}$ -plo aequantibus. Cymæ axillares solitariæ, pedunculis 1 em. longis apice ramosissimis, ramis bis terque umbellatis, pedicellis ultimis angulatis glabris rubescens in 5 mm. longis basi ad ramificationem bracteatis, bracteis cuspidato-triangularibus $\frac{1}{2}$ mm. longis. Calyx patens 2 mm. in diametro 7-9-lobatus, lobis late cuspidiformibus $\frac{2}{3}$ mm. latis $\frac{1}{2}$ mm. longis acutis, subdenticulatis \pm sulcatis. Fructus præmaturi globosi.

HAB. Uraisha, leg. N. KONISHI, Aug. 1906.

Differs from the type by the much narrower leaves with acute or obtuse base which is never rounded as is the case with the type.

Ilex trichoclada HAYATA sp. nov. Rami recti veteriores, cortice fusco-cinerascenti tenuiter longitudinaliter rugos, fusco-pubescentes non lenticellati, novelli fulvo-villosi, pilis brevissimis densis rectis. Folia oblongo-elliptica, elongato-oblonga, $3\frac{1}{2}$ cm. longa 12 mm. lata, apice acuta vel subaeuminata, ad summum aristato-acuta, basi cuneato-acuta, chartacea, supra prope costam pubescentia cæterem glabra, subtus tenuiter pubescentia ad costas dense pubescentia, costis supra tenuissime sulcatis elevatis, venis lateralibus primariis utroque latere 5-6 tenuissimis utraque pagine distinctis rectis prope marginem recurvatis eam proximam superiorem attingentibus, margine plana nunquam recurva remote serrulata a medio deorsum integra, serrulis apice aristatis, petiolis brevissimis 2 mm. longis dense fulvo-pilosis intus sulcatis. Fructus ad axillas subfasciculati, pedicellis 3 mm. longis breve hirsutis basi bracteis 2-3 instructis. Calyces fructiferi 6-lobati, lobis patentibus tenuibus triangularibus $\frac{3}{5}$ mm. longis obtusis margine denticulatis. Fructus globosi rubescentes in exsiccato subsulcati, stigmate persistenti subconico.

HAB. Fokien: Ysan, Nov. 1909, leg. S. NAGASAWA, (No. 97.); Kelung: Taiheishō, leg. Y. SHIMADA, Dec. 1908, (Fr.).

Near *I. yunnanensis* FRANCH., but differs from it by the much thinner and smaller leaves and 6-merous calyx.

Ilex Warburgii LÆS. Monogr. Aquifoliae. p. 326.

Celastrineæ.

Euonymus LINN.

Euonymus acutorhombifolia HAYATA sp. nov. Ramuli ultimi tetragoni, ad angulos angustissime alati, subpallidi. Folia opposita rhomboideo-oblonga, apice breve acuminata basi subito recto-cuneata, ad extremitatem attenuata, $8\frac{1}{2}$ cm. longa, 4 cm. lata, chartacea-coriacea, supra nitida, in exsiccato

supra pallida subtus pallidissima, costis et venis utraque pagine distincte elevatis \sim formiter recurvis, venis primariis lateralibus utroque latere 4, a medio sursum serrata deorsum subintegra ad marginem leviter recurva subsessilia vel petiolis brevissimis 1-2 mm. longis. Flores 1-2 subfasciculati vel breve paucque racemosi, bracteis lanceolato-triangularibus crassiusculis margine rubro-ciliolatis, pedicellis 1-1½ cm. longis. Sepala 4, late rotundata, denticulato-ciliolata. Petala 4 late rotundata, margine denticulato-ciliolata. Stamina 4, antheris late reniformibus 1½ mm. latis $\frac{2}{3}$ mm. longis subsessilibus ad apicem dentium disci siti, filamentis brevissimis vel 0. Discus concavus, rectangulari-formis remote obseure 4-dentatus, dentibus remotis latissimis. Ovarium vix elevatum vel subplanum, stylo brevissimo.

HAB. Montibus maritimis Formosæ, ad 4000 ped. alt., leg. Y. FURUKAWA, Mart. 1910.

Euonymus pallidifolia HAYATA sp. nov. Ramuli recti albo-flavescentes vel pallidissimi, teretes, nec rugosi nec lenticellati, cortice albo-flavescenti, foliati. Folia in exsiccato albo-flavescentia, pallidissima, concolora, opposita, oblonga, rotundato-oblonga coriacea, apice acuta vel obtusa sed ad extremitatem semper obtusa vel leviter retusa, basi rotundata acuta rotundato-obtusa, supra utraque pagine glabra, costis supra acuto-elevatis subtus minus elevatis vel obtuso-elevatis, venis lateralibus primariis supra tenuissime elevatis subtus non visis vel minus elevatis utroque latere 5-6 rectis angulo 50°-60° a costa egressis, margine integerrima angustissime arete desuper recurva marginata, petiolis brevissimis 5 mm. longis $\frac{1}{6}$ -plo laminam aequantibus. Flores non visi. Pedunculi fructiferi axillares solitarii 3½ cm. longi erecti. Capsula depresso-globosa, 1½ cm. in diametro 7 mm. longa, rubro-flavescens, 3-valvatim delicens, valvis lignoso-coriaceis, 3-locularis, loculis 1-spermis. Semina quadratiformia 8 mm. longa inæqualiter 3-4 striata apice arillis rubris coronata.

HAB. Kōshum, leg. NISHIGAKI, Jan. 1910.

Euonymus pellucidifolia HAYATA sp. nov. (Tab. X.) Frutex 3-4 m. alta recta, ramis et ramulis subviridescentibus subgracilibus rectis longitudinaliter sulcatis non lenticellatis glabris. Folia opposita, glaberrima,

oblonga, oblongo-lanceolata vel lanceolata, apice acuminato-cuspidata, basi cuneato-attennata, 10–13 cm. longa 4 cm.–2½ cm. lata, chartaceo-membranacea vel chartacea, pellucida, supra nitida in exsiccato pallida, concolora, (costis intraque pagee elevatis distinctis, venis lateralibus primariis supra tenuiter distincte elevatis subtus non distinctis vix visis utroque latere 4–5 remotis, — formiter recurvis), margine remote serrulata, (serrulis subobtusis) deorsum integra, petiolis $\frac{1}{6}$ – $\frac{1}{12}$ –plo laminam aequantibus 10–7 mm. longis intus profunde sulcatis extus transversim rugosis. Cymæ axillares solitariae vel 3–4-fasciculatae ad ramulos brevissimos sitæ 2–3 cm. longæ paucissime dichotome floriferæ, ad ramificationem bracteatae, bracteis minutis deciduis, pedicellis 7–8 mm. longis medio articulatis. Flores patentes 7 mm. in diametro. Sepala 5 late orbicularia patentia in magnitudine inæqualia, minoribus 1½ mm. latis majoribus 2½ mm. latis, margine rubro-ciliolata. Petala 5, inæqualia late rotundata, (majoribus 3 mm. longis 3½ mm. latis), rubescens margine minute denticulata, basi contracta ½–1 mm. lata. Stamina 5 ad discum sita, filamentis brevissimis vix 0, antheris reniformibus ¾ mm. latis ½ mm. longis, loculis divaricatis ad apicem connectivorum oblique vel transversim sitis albis, connectivis incrassatis minute rubro-punctatis. Discus subplanus rotundatus, 2½ mm. in diametro, leviter 5-lobatus. Ovarium in disco subimmersum late conicum 5-loculare, loculis 1-ovulatis, ovalis erectis, stylo brevissimo.

HAB. Suisha, ad 2000 ped. alt., leg. B. HAYATA et S. SASAKI Mai. 27, 1912.

Euonymus Dielsiana HAYATA (non Lœsner) in Mater. Fl. Formos. p. 58.

The present plant is certainly near *E. Dielsiana* Lœs. from which it is distinguishable in having 5-merous flowers. It is collected by Mr. S. SASAKI and myself in my last excursion to the island in a forest by Suisha-lake on an altitude of nearly 2000 ft. The tree is very well known among savages, on account of its superior quality for making a kind of bow.

Celastrus LINN.

Celastrus oblongifolia HAYATA sp. nov. Scandens ramis teretibus longitudinaliter rugulosis lenticellatis, lenticellis rotundatis, glabris,

Folia chartacea, ovato-oblonga vel ovato-elliptica apice acuminata, basi rotundato-obtusa vel rotundata, 10 cm. longa 4 cm. lata, margine remote mucronato-serrulata, (mucronibus a se 4 mm. remotis), nigrigantia, costis supra tenuiter elevatis subtus valde elevatis, venis supra tenuiter subtus distincte elevatis, venis lateralibus primariis utroque latere 6, costis subtus breve hirsutis vel subglabratibus, venis arcuatis, petiolis 12 mm. longis $\frac{1}{6}$ -plo laminam aequantibus. Flores non visi. Capsula paniculata, (pedicellis 1 cm. longis) 3-valvatim dehiscens, ovata, apice apiculata, valvis lignoso-coriaceis. Semina subquadrantiformia interiore recurvata, arillis rubris.

HAB. Arisan, Jan. 1912, leg. B. HAYATA et S. SASAKI.

Near *C. articulatus*, but differs from it in having much longer narrower leaves.

Gymnosporia W. et A.

Gymnosporia trilocularis HAYATA sp. nov. Rami subrecti teretes, cortice cinerascenti longitudinaliter sulcato-ruguloso. Folia ad ramiculos brevissimos laterales ternatim sita, obovata vel obovato-cuneata, 5 cm. longa 33 mm. lata, coriacea, apice rotundata, basi cuneata, in exsiccatu remote crenata, ad sinus crenarum nigro-mucronato-punctata, costis supra distincte costatis, subtus elevatis, venis lateralibus supra tenuissime subtus distincte elevatis grosse reticulatis, petiolis 4 mm. longis circ. $\frac{1}{6}$ -plo laminam aequantibus supra utroque latere subalatis sulcatis. Cymæ ad apicem ramorum brevissimorum lateralium fasciculatæ. Flores non visi. Cymæ fructiferæ 3 cm. longæ, pedicellis 1 cm. longis. Capsula trilocularis, valvis late rotundatis 5 mm. longis apice mucronatis. Semina oblonga, 3 mm. longa, 2 mm. lata, testa nitida fusco-rubescenti, basi arillata.

HAB. Kōtōshō: litore occidentali, leg. K. MIYAKE, Nov. 1899.

Celastrus trilocularis HAYATA in Herb. Mus. Taihoku.

The present plant is near *G. diversifolium* MAXIM., from which this is distinguishable by the larger leaves and trilocular capsules.

Cassine LINN.

Cassine illiciifolia HAYATA sp. nov. (Tab. XI.) Frutex? Rami et ramuli subgraciles, longitudinaliter rugulosi, lenticellati, ramulis ultimis (cortice subfuscō-rubescēti) glabris longitudinaliter subalatis sulcato-rugulosis cicatricibus foliorum semi-oblongis notatis. Folia opposita ovata obovato-lanceolata, apice acuta acuminata, ad summum obtusa, basi cuneata, acuminata, gradatim ad petiolum abeuntia, circ. 7 cm. longa 2½-3 cm. lata chartacea vel tenuiter coriacea vel membranaceo-coriacea, in exsiccato supra pallida, nitida, subitus albo-pallidissima, costis supra distinete graciliter elevatis subitus planis non distinctis, venis lateralibus primariis tenuissimis distinctis utroque latere 7-8 subrectis angulo 40°-50° a costa egressis subitus non distinctis, margine integerrima, petiolis ¼-plo laminam aequantibus subalatis subplicatis 7 mm. longis glabris. Flores breve cymosi vel solitarii, cymis axillaribus dichotome ramosis paucifloratis, pedicellis 3 mm. longis apice 2-bracteatis, bracteis rotundato-triangularibus 1 mm. longis subacutis margine rubro-denticulatis. Calyx obconicus, lobis 4 decussatim imbricatis late rotundatis 1 mm. longis 2 mm. latis, margine fimbriato-albo- vel -rubro-ciliatis pagine glabris. Petala 4 calycis lobis alterna, ad faucem calycis affixa ovato-oblonga 2 mm. longa 1½ mm. lata crassiuseula apice obtusa denticulata exteriore reflexa, basi contracta ½ mm. lata, latere margine integra, intus convexa extus concava. Stamina 4, ad faucem calycis affixa, filamentis validiusculis rectis, antheris reniformibus versatilibus introrsum dehiscentibus. Discus sub-campanulatus calycis tubo adnatus, apice 4-lobatus, lobis liberis cum stamine alternis late liguliformibus ¾ mm. latis ½ mm. longis. Rudimentum ovarii (vel ovarium?) subconicum brevissimum 2-loculare, loculis 1-ovulatis, stylo breve columnari cum ovariis 1½ mm. longo tenuiter 4-sulcato. Capsula oboviedo-cylindrica 13 mm. longa 5 mm. lata, pericarpio coriaceo, 1-sperma. Semina obovoidea 12 mm. longa, testa rubra.

*Otherodendron illiciifolium** HAYATA in Sched. (Herb. Taihoku Museum.)

* The genus *Otherodendron* MAKINO, to which the present plant with the following two species was provisionally referred, is separated from *Cassine* LINN. in having a dehiscent capsule. The fruit of the former has very similar structure as that of the latter which has sometimes 1 or 2 seeds within a hard coriaceous pericarp.

HAB. Arisan, ad 7500 ped. alt., leg. S. SASAKI, Mart. 1911. (Fl. ♀); Taito: Takukeisha, leg. U. MORI, Dec. 1906. (Fr. ♀).

The male flowers are very like those of *C. japonicus*, but differs from them by the much smaller form. Fruits are also much smaller than those of the Japanese species.

Cassine kotœnsis HAYATA sp. nov. Frutex. Rami et ramuli recti, cortice longitudinaliter ruguloso, ramulis longitudinaliter sulcato-rugulosis rubescens. Folia opposita, obovata, rotundato-oblonga, rhomboideo-oblonga, apice acuta breve cuspidata ad summum obtusa, basi cuneato-acuta ad extremitatem subito attenuata ad petiolum abeuntia, chartacea vel tenuiter coriacea, pallida vel viridescentia, costis utraque pagine elevatis distinctis, venis lateralibus primariis utroque latere 5-6 reetis vel \sim formiter curvatis utraque pagine tenuissime elevatis, venulis supra interdum inconspicuo-reticulatis, margine integerrima, petiolis 8 mm. longis interiore plicato-sulcatis laminam $\frac{1}{6}$ -plo aequantibus. Flores cymosi, cymis axillaribus solitariis dichotome ramosis, pedunculis 1 cm. longis. Flores maturi non visi.

Elæodendron japonicum HAYATA, (non FR. et SAV.) in MATSUM. et HAYATA Enun. Pl. Formos. p. 84; *Otherodendron kotœnse* HAYATA in Sched. (Herb. Mus. Taihoku.)

HAB. Kōtōshō, leg. K. MIYAKE, Nov. 1899.

Cassine micrantha HAYATA sp. nov. Ramuli gracieles, recti, divaricati, cortice fusco-rubescenti, glabri longitudinaliter rugosi. Folia rhomboideo-oblonga vel obovato- vel ovato-oblonga, apice cuspidato-acuta, basi late cuneata vel subito acuta ad extremitatem breve attenuata, 9-10 cm. longa 5-5½ cm. lata, membranaceo-chartacea vel chartacea, in exsiccato costis utraque pagine elevatis, venis lateralibus primariis utroque latere 7-8 reetis vel \sim formiter recurvis supra tenuissime et distincte elevatis subtus minus distinctis, venulis supra minute reticulatis subtus minus distinctis, in exsiccato utraque pagine pallida, margine integra, petiolis $\frac{1}{2}$ cm. longis interiore sulcato-plicatis laminam $\frac{1}{6}$ -plo aequantibus. Flores cymosi, cymis axillaribus solitariis 5-6-floratis dichotome-floriferis, pedunculis 4 mm. longis, pedicellis

1-2 mm. longis apice 2-bracteis instructis, bracteis triangularibus 1½ mm. longis acutis dorso acuto-angulatis margine rubro-ciliatis; flores sub calyce cum pedicellis articulati. Flores maturi non visi.

HAB. Byōritsu: Shinsuiye, leg. T. KAWAKAMI, Oct. 1908, (No. 7192).

Rhamneæ.

Rhamnus LINN.

Rhamnus acuminatifolia HAYATA sp. nov. Rami, cortice cinerascenti longitudinaliter lenticellato et rimis longitudinalibus fisso. Folia alterna oblongo-lanceolata vel obovato-lanceolata, maxima 13 cm. longa 4½ cm. lata, tenuiter chartacea, apice acuminata vel euspidato-acuminata basi cuneato-obtusa vel acuta, margine minute serrulata prope basin integra, supra ad costam sulcata, subtus costis elevatis, venis lateralibus primariis supra tenuissime impressis vel non impressis subtus distinete elevatis rectis prope marginem subito arenato-ascendentibus eam superiorem proximam attingentibus 30°-40° a costa divaricatis, venulis transversis tenuissimis, utraque pagine glabra, petiolis laminam ¼-plo aequantibus 12 mm. longis hirsutis intus sulcatis teretibus. Flores umbellati, umbellis pedunculatis, pedunculis pedicello brevioribus solitariis axillaribus hirsutis. Calyx hirsutus, lobis triangularibus acutis. Flores apertientes non visi.

HAB. Nantō: Rokujōdaisan, leg. U. MORI, 1908, Aug. Fr. (No. 1156); Ritōzan, leg. T. KAWAKAMI, Juli. 1913.

Differs from *R. crenata* S. et Z. by the much more acuminate and narrower leaves.

Rhamnus japonica MAXIM. var. **decipiens** MAXIM.

HAB. Fōkien: Usekisan, Oct. 1910, leg. S. NAGASAWA.

Compared with a specimen of this variety in the Tōkyō Herbarium.

Rhamnus nepalensis LOUR. Cult.

Rhamnus Sieboldiana MAKINO in Tōkyō Bot. Mag. XXVI, p. 392.

HAB. Fokien : Seizengi (cult.?), leg. S. NAGASAWA, Aug. 1910.

Compared with a specimen of this species in the Tōkyō Herbarium.

Ampelideæ.

Cissus LINN.

Cissus pteroclada HAYATA (Tab. XII.) Ic. Pl. Formos. II. p. 107.

Descriptio auctata : Calyx late campanulatus, $1\frac{1}{2}$ mm. longus, $2\frac{1}{2}$ mm. latus, apice truncatus. Petala conduplicato-valvata, elongato-triangularia $2\frac{1}{2}$ mm. longa, basi $1\frac{1}{2}$ mm. lata, basi tenuia, apice erassiuscula cuculliformia, erecta. Stamina 4 cum petalis opposita 2 mm. longa, filamentis $1\frac{1}{2}$ mm. longis, antheris ovoideis $\frac{1}{2}$ mm. longis, connectivis incrassatis. Ovarium subconicum apice acutum ad stylum brevem abeuns, stylo brevissimo 1 mm. longo, stigmate oblique terminali.

Vitis LINN.

Vitis leucocarpa HAYATA sp. nov. Caulis subteres glaber, longitudinaliter minute multi-sulcatus. Folia pedatim 5-foliolata, foliolo terminali petiolulato lanceolato apice acuminato basi obtuso vel acuto, petiolulis lateralibus angulo recto divaricatis apice furcatim ramosis foliolos laterales gerentibus, foliolis lateralibus oblique oblongis acutis minoribus omnibus serratis, (serris apicalatis), prope basin subintegris, petiolis communibus lamina folioli terminalis æquilongis gracilibus. Fructus baccati albicantes depresso globosi, 6-7 mm. in diametro. Semina 5, quadrantiformia, testa dura dorso transverse rugosa.

HAB. Suisha, Mai. 1912, leg. S. SASAKI et B. HAYATA.

This is very near *V. japonica* and *V. corniculata*; but differs from them by the much smaller leaves and white fruits.

Vitis umbellata HEMSL. var. **arisanensis** HAYATA n. v. Caulis gracilis teres glaber vel hirsutus, ramis et ramulis valde divaricatis. Folia digitatim 5-foliolata in ambitu cordata, foliolo terminali magno sublanceolato vel

ovato-lanceolato 3-5 cm. longo 1½ cm. lato acuto vel acuminato basi acuminato-cuneato apice ad summum calloso-aristato membranaceo vel membranaceo chartaceo supra glabro viridissimo subtus glabro pallidiore, (costis supra acute elevatis subtus obtuse elevatis, venis lateralibus utroque latere 4-5 supra non elevatis subtus tenuiter impressis et distinctis), margine utroque latere dentibus ascendentibus 5-6 (dentibus apice obtusis aristatis callosis), foliolis lateralibus obliquis minoribus, eis basilaribus minimis sessilibus, petiolis communibus gracilibus glabris vel tenuiter hirsutis foliolo terminali æquilongis vel longioribus, stipulis majusculis latis oblique oblongo-triangularibus 3 mm. longis apice obtusis scariosis margine minute ciliolato-denticulatis cum eis oppositis caulem amplectantibus, cirrhis oppositifoliis multiramosis. Fructus umbellati, umbellis pedunculatis, pedunculis 3 cm. longis, a medio deorsum 6-4-bracteis instructis, bracteis oppositis stipula conformibus, pedicellis (radiis) 1½ cm. longis. Fructus baccati, globosi 1-2-spermi. Semina rotundata plano-convexa 4-5 mm. in diametro, facie et dorso vermiculata rugulosa.

HAB. Mt. Arisan, leg. B. HAYATA et S. SASAKI, Jan. 1912.

Differs from the type by the much smaller and narrower leaves.

Sapindaceæ.

Kœlreuteria LAXM.

***Kœlreuteria formosana* HAYATA** (Tab. XIII.) Folia bipinnata obovata, 40-50 cm. longa, 30 cm. lata, pinnis 9-11; pinnis infimis minimis a basi petoli 8 cm. distantibus 5-foliolatis, foliolo terminali ovato-acuminato 6 cm. longo 3 cm. lato basi obtuso apice cuspido-acuminato supra nitido subtus pallidiore margine subintegro vel pauci-serrato, costis supra tenuiter elevatis subtus prominentibus, venis lateralibus tenuibus subtus elevatis prominentibus, foliolis lateralibus lanceolatis terminali minoribus angustioribus basi obliquis, petiolulis 2 mm. longis; pinnis mediis majoribus 20 cm. longis 13 cm latis 9-11 foliolatis, foliolo terminali majore, lateralibus obliquis acuminatis pauciserratis; petiolis communibus cum rhachidibus 40 cm. longis,

lenticellis rotundatis notatis glabris longitudinaliter rugosis basi incrassatis. Capsula vesicularis, inflata, 3-lobata, loculicide 3-valvata, valvis membranaceis reticulato-nervosis rotundatis 4½ cm. longis 4 cm. latis margine tenuiter marginatis, septis seminiferis. Semina subglobosa nigra exarillata, testa crustacea nigra; embryo spiraliter convolutus.

HAB. Tappansha, leg. U. MORI, Oct. 1906, (No. 1736).

Near *Kaurenteria bipinnata* FRANCH., but differs from it in having subentire leaflets.

Acer LINN.

Acer (*Integrifolia*) cinnamomifolium HAYATA sp. nov. (Tab. XIV.-A.)

Rami recti, cortice fuscō-rubescēti, longitudinaliter rugosi, lenticellis parvis tenuiter elevatis medio 1-sulcatis, ramulis hornotinis basi dense mollissime tomentosis perulis multiseriatis instructis, perulis scariosis extimis minoribus triangularibus 2 mm. longis obtusis convexis, intimis longissimis 1 cm. longis sublinearibus molle tomentosis. Folia ad apicem ramulorum oppositū sita, lamina ampla membranacea vel membranaceo-chartacea, elliptica vel oblonga vel ovato-elliptica 11-12 cm. longa 4½-5 cm. lata, apice breve cuspidata ad summum obtusa basi obtusissima vel subrotundata, margine integra vel grosse obscure undulata, supra glaberrima vel ad costas tomentosa, subtus tenuissime dense mollissimeque tomentosa, albicantia, supra in exsiccatō fulvescentia, costis et venis rubescētibus utraque pagine tenuissime elevatis, venulis secundariis supra minute tenuissime elevato-reticulatis, distincte trinervia, nervis lateralibus latere inferiore plus ramosis, nervo centrali pauci-ramoso utroque latere venulas 2-3 emittenti, petiolis gracilibus ½-plo laminam aequantibus supra sulcatis subteretibus basi tomentosis. Cymæ ad ramulos terminales, 6 cm. longæ totiusque latæ, rhachidibus pedicellisque dense albo-tomentosis, pedicellis gracilibus 3 cm. longis erectis. Sepala 4-5 linearia, 2-4 mm. longa, ½ mm. lata, apice obtusa, extus hirsuta, intus glabra, patentia. Petala 4-5, linearia vel linearispathulata, apice obtusa, basi angustata, 3-4 mm. longa, 1 mm. lata, utraque pagine glabra. Discus extrastaminalis, 8-10-partitus, segmentis latis subglobosis ½ mm. latis. Stamina 8-10, filamentis 1½ mm.

longis glabris, antheris oblongis 1 mm. longis emarginatis vel apiculatis. Ovarium dense hirsutum late obtriangulare 2 mm. latum $1\frac{1}{2}$ mm. longum, stylo prope basin 2-fido, ramis patentio-recurvatis $1\frac{1}{2}$ –2 mm. longis.

HAB. Fokien: Kosan, leg. S. NAGASAWA.

Very interesting species, remarkable for its trinerved leaves which are covered by very thin soft tomentum. It is certainly a species referable to the section *Integriifolia* PAX.

Acer (Integriifolia) hypoleucum HAYATA sp. nov. (Tab. XIV.-C.)
 Rami subrecti, longitudinaliter leviter rugulosi, lenticellis longitudinaliter notati, lenticellis medio sulcatis, cortice fuscenti, ramulis ultimis molle tomentoso-pubescentibus. Folia opposita oblonga vel elliptica apice obtusissima interdum ad summum retusa vel non retusa, basi rotundata vel obtusa, circ. 8 cm. longa $3\frac{1}{2}$ –4 cm. lata, chartaceo-coriacea, margine integra vel leviter undulata, supra glabra, in exsiccato fulvo-rubescens, subtus glaucescens albicantia leviter albo-purpurascens tenuissime molle tomentosa, costis supra tenuiter elevatis vel non elevatis rubescens subtus prominente elevatis, venis lateralibus primariis utroque latere 5 subrectis vel medio sursum subreflexis angulo 50° – 60° a costa egressis, petiolis subgracilibus 2 cm. longis laminam $\frac{1}{4}$ -plo in longitudine aequalibus supra tenuiter sulcatis basi leviter incrassatis. Flores non visi. Cymæ fructiferæ ad ramos laterales terminales, 5 cm. longæ 7 cm. latæ, rhachidibus et pedicellis pubescentibus, pedicellis gracilibus $1\frac{1}{2}$ cm. longis. Carpelli loculi valde prominentes facie grosse reticulato-striati glabri superne (apice) impressi; alæ cum localis 17 mm. longæ 6 mm. latæ angulo 80° a se divaricatae.

HAB. Baatankei, leg. U. MORI, Juli. 1912.

Near *A. nevium* BLUME, *A. oblongum* WALL. and *A. lanceolatum* MOLLIARD; but differs from the first by the quite obtuse leaves which are whitish on the underside, from the second by the quite obtuse oblong leaves thinly covered by very soft wools and from the last by the oblong elliptic leaves.

Acer (Integriifolia) litseæfolium HAYATA sp. nov. (Tab. XIV.-B.)
 Rami et ramuli glabri, cortice fuscenti lenticellis minutis notato. Folia

oblanceolata, chartacea, vel chartaceo-coriacea, 10 cm. longa 23 mm. lata, apice acuminata ad summum obtusissima, basi acuta vel cuneata, supra glabra, subtus glauca, costis et venis supra planis subtus prominentibus, venis primariis lateralibus utroque latere 8–10, venulis subtus transverse reticulatis, petiolis $\frac{1}{4}$ -plo laminam in longitudine aequantibus circ. $2\frac{1}{2}$ cm. longis intus sulcatis basi incrassatis. Cymæ fructiferæ ad ramos terminales, 4 cm. longæ 5 cm. latæ, rhachidibus et pedicellis glabris, pedicellis 1 cm. longis vel longioribus. Carpelli alæ semi-oblongæ angulo 70° a se divaricatae, cum loculis 2 cm. longæ, loculis subglabris.

HAB. Montibus prope Nantō, leg. Z. ŌHASHI.

Somewhat like *A. oblongum* WALL., but differs in its oblanceolate leaves.

Acer (Indivisa) taiton-montanum HAYATA sp. nov. Rami graciles, subrecti, toto glabri non lenticellati, sublaeves, fusco-rubescentes. Folia trianguli-cordata, membranacea vel membranaceo-chartacea, 6 cm. longa 5 cm. lata, apice trianguli-acuminata, basi profunde cordata, elobata vel subtrilobata, margine duplicato-serrulata, glaberrima, trinervia, nervis et venis tenuissimis et distinctis subplanis vel leviter elevatis, nervis lateralibus angulo 50° a eo centrali divaricatis, venis lateralibus nervi centralis utroque latere 7–8, 7 mm. a se remotis rectis angulo 40° a costa divaricatis, petiolis 2 cm. longis $\frac{1}{3}$ -plo laminam in longitudine aequantibus intus late sulcatis basi haud incrassatis. Racemi fructiferi subterminales subpenduli; carpelli alæ oblongæ cum loculis 27 mm. longæ 7–8 mm. latæ apice obtusæ angulo 100° a se divaricatae; loculi nervati.

HAB. In monte Taiton, leg. U. FAURIE, Mai. 1903.

This differs from *A. insulare* in having cordately based leaves, from *A. laxiflorum* in the shorter caudate leaves, from *A. crataegifolium* in the thinner cordate leaves, and finally from *A. Kawakamii* and *A. morrisonense* by the longer winged carpels.

***Euscaphis* SIEB. et ZUCC.**

Euscaphis Konishii HAYATA sp. nov. Rami teretes, cortice glabro cinereo-fusco-marmorato longitudinaliter fisso. Folia opposita impari-pinnata

in ambitu ovata cum foliolis 10 cm. longa 6-7 cm. lata, foliolis saepe 5 obovatis 4 cm. longis 2½ cm. latis chartaceis apice cuspidato-acutis basi cuneato-acutis margine crenulatis ad apicem crenarum apiculatis, (costis intraque pageine elevatis venis lateralibus tenuissime elevatis), in exsiccato supra fuscantibus subtus pallidis vel pallidissimis. Flores ignoti. Carpella 4, divaricata, stipitata, ovata, apice late breveque rostrata, cum stipitibus 1 cm. longa 5 mm. lata. Semina compresso-subglobosa in arillis inclusa, 6 mm. longa 5 mm. lata.

HAB. Hainan, leg. N. KONISHI, 1909.

Differs from *E. japonica* by the shortly stalked carpels and by the crenulate leaves. It is named after the lamented N. KONISHI, in commemoration of his great botanical services. The plant was collected by him in the summer of the year 1909 in the island of Hainan, where he was taken with a fatal fever. After coming back to Taihoku, he died much to the sorrow of the present writer and to a great loss to the botanical world.

Sabiaceæ.

Meliosma BLUME.

Meliosma callicarpæfolia HAYATA sp. nov. Rami et ramuli graciles longitudinaliter rugosi, hornotini dense rubro-ferrugineo-pubescentes. Folia alterna chartacea vel membranaceo-chartacea, oblanceolata, obovato-lanceolata, 10-15 cm. longa, 3-4 cm. lata, apice acuminata vel caudato-acuminata, basi cuneata, cuneato-attenuata, margine subintegra vel repanda, intraque pageine glabra, supra ad costas elevatas hirsuta, subtus ad axillas venarum hirsuta, costis infra elevatis, venis lateralibus supra tenuiter subtus prominente elevatis, venis secundariis supra tenuiter subtus prominente reticulatis, basi gradatim attenuata ad petiolum abeuntia, petiolis 2-3 cm. longis gracilibus supra superiore alatis hirsutis basi inerassatis, partibus incrassatis 4 mm. longis. Paniculæ terminales 10-13 cm. longæ 7-8 cm. latæ graciles ramosæ, ramis ramulisque gracillimis dense fuscopubescentibus, floribus spicatim gerentibus, pedicellis ultimis ½ mm. longis basi bractea una instructis, bracteis

ovatis acuminatis $\frac{1}{2}$ mm. longis ciliolatis, ciliis setulosis. Alabastrum floris minutum; sepala 4 late orbicularia 1 mm. lata $\frac{2}{3}$ mm. longa. Flores apertientes non visi.

HAB. Baantankei, leg. U. MORI, Juli. 1912; Arisan, leg. UYEMATSU, Jan. 1913.

Meliosma sp. nov. ? aff. **sumatrana** Miq.

HAB. Kōtōshō.

Leguminosæ.

Indigofera LINN.

Indigofera kotœnsis HAYATA in Mater. Fl. Formos. p. 75. Descriptio auctata. Racemi fructiferi 5-10 cm. longi, profuse fructus gerentes. Legumina linearia 3 cm. longa $\frac{1}{2}$ cm. lata, subcomplanata, apice breve rostrata, basi obtusa, facie paucissime pubescentia, subrecta vel \pm recurva, fusco-nigricantia.

HAB. Garambi, Mai. 1912, leg. B. HAYATA.

Desmodium DESV.

Desmodium dispermum HAYATA sp. nov. Rami recti, lenticellis globosis minutis, cortice longitudinaliter soluto, ramulis novellis albo-hirsutis gracilibus rectis. Folia 3-foliolata, foliolo terminali obovato circ. 2 cm. longo 13 mm. lato apice rotundato emarginato minutissime macronato basi cuneato obtuso supra (in exsiccato) fusco-nigricanti subglabro subtus pallido adpresso hispidulo ad costas et venas hirsuto, supra costis venisque planis subtus tenuiter elevatis, venis lateralibus primariis utroque latere 7-8 parallelis distinctis venulis minutissime obseure reticulatis inconspectis, petiolulo $1\frac{1}{2}$ mm. longo, foliolis lateralibus eo terminali conformibus \pm minoribus, stipellis setiformibus 1 mm. longis, rhachidibus (inter petiolulum terminalem et petiolum) 3 mm. longis, petiolis 7 mm. longis cum rhachidibus supra sulcatis hirsutis, stipulis lineari-lanceolatis 4 mm. longis 1 mm. latis extus hirsutis intus glabris. Cymæ axillares uni- vel pauci-floræ, pedunculis 8 mm. longis, pedicellis 3-4 mm. longis, bracteolis 2 basi calycis dispositis ovatis $2\frac{1}{2}$ mm.

longis apice acuminatis multinerviis extus hirsutis intus glabris. Calyx fusca extus albo-pubescent, campanulatus, 4 mm. longus, lobo postico (lobis posticis 2 connatis) oblongo-triangulari 2 mm. longo totiusque lato apice cuspido, cuspibus 1 mm. longis, lobis lateralibus triangularibus 2 mm. longis acuminatis lobo antico ovato-triangulari 4 mm. longo apice acuminato. Vexillum obcordatum 1 cm. longum 8 mm. latum apice rotundato-2-lobatum (lobis 1 mm. longis), basi enneato-acutum, ad insertionem $\frac{1}{2}$ mm. latum; alis obovato-oblongis unguiculatis, laminis obovatis 7 mm. longis 3 mm. latis basi latere superiore auriculatis, unguibus 2 mm. longis; carinis unguiculatis, laminis semi-oblongis 8 mm. longis $3\frac{1}{2}$ mm. latis apice obtusis basi ad unguem abeuntibus latere superiore rectis latere inferiore rotundatis, gibboso-inflatis, unguibus linearibus 3 mm. longis. Stamina monadelpha tubo filamentorum 6-7 mm. longo, partibus liberis 5 mm. longis. Ovarium lineare 2 mm. longum hirsutum, stylo filiformi medio vel infra medium hirsuto sursum glabro ad medium angulo recto flexo, stigmate punctiformi. Legumen valde complanatum medio constrictum di-spermum, articulis 2 a se solutis oblongis 8 mm. longis 5 mm. latis facie reticulatis adpresso hirsutis.

HAB. Formosu: Loco non indicato.

Near *D. umbellatum* DC., but differs from it by the 2-seeded pods.

Uraria DESV.

Uraria latisepala HAYATA sp. nov. Suffrutex, caulis rectus, teres, leviter sulcatus, dense hirsutus vel pilosus. Folia alterna, trifoliata, foliolo terminali magno oblongo elliptico 8 cm. longo 4-4½ cm. lato apice obtuso ad suum apiculato (apiculis 1-2 mm. longis) basi cuneato-obtuso integro chartaceo-membranaceo supra tenuiter subtus dense hirsuto, (costis supra tenuissime subtus prominente elevatis, venis primariis lateralibus utroque latere 15 rectis vel sensim recurvis ad marginem attingentibus supra tenuissimis subtus plus distinctis, venulis secundariis inter venas primarias transversim dispositis reticulatis), petiolulis 2 mm. longis teretibus hirsutis, stipellis lanceolatis acuminatis 3-4 mm. longis, rhachidibus 1½ cm. longis teretibus sulcatis, foliolis lateralibus eo terminali minoribus id ¾-plo aequantibus 6 cm. longis 2½ cm. latis basi ± obliquis rotundato-obtusis, petiolum com-

minibus 2 cm. longis. Racemi 15 cm. longi axillares vel terminales, pedicellis $\frac{1}{2}$ cm. longis. Calyx fructifer late campanulatus extus strigosus dense pilosus intus glaberrimus, tubo 2 mm. longo limbo 5-lobo, lobo antice longissimo cuspidiformi 6 mm. longo apice acuminato-cuspidato basi 2 mm. lato multinervio, lobis caetris \pm brevioribus 4 mm. longis oblongis basi 2 mm. latis apice acuminatis. Petala non visa. Fructus spiraliter recurvus, reticulatus.

HAB. Mt. Tōhozan, ad 6500 ped. alt., leg. T. KAWAKAMI et S. SASAKI, Oct. 1909.

Near *U. hamosa*, but differs from it by the much shorter pedicels and much broader lobes.

Uraria logopoides DC. in MATSUM. et HAYATA Enum. Pl. Formos. p. 108.

HAB. Yaeyama archipelago : Ishigakshima, Juli. 1911, leg. S. KANAGI.

Uraria picta DESV.; HAYATA Ic. Pl. Formos. p. 189.

HAB. Takaosan, leg. R. PRICE, (No. 608); Yaeyama archipelago : Ishigakshima, leg. S. KANAGI.

Lespedeza MICHL.

Lespedeza pseudomacrocarpa HAYATA sp. nov. (Tab. XV.) Frutex glaber, ramosus. Folia pinnatim trifoliolata, pinnis oblongo-ovatis apice rotundato-retusis brevissime mucronatis in exsiccato supra fuscis subtus pallido-glaucis reticulato-venosis, pinna terminali $3\frac{1}{2}$ cm. longa $1\frac{1}{2}$ cm. lata, petiolulo 1 em. longo, lateralibus terminali conformibus sed minoribus $2\frac{1}{2}$ cm. longis, petiolulis 2 mm. longis, petiolis 2 cm. longis, stipulis subulatis scariosis 4 mm. longis, stipellis obsoletis vel minutis. Flores racemoso-paniculati. Calyces campanulati 5 mm. longi pubescentes, 5-fidi, lobis 2-superioribus connatis, 2-inferioribus linearibus vel subulatis 3 mm. longis. Vexillum obovatum 12 mm. longum 7 mm. latum, apice obtusum basi gradatim angustum. Alae lineares 12 mm. longae, (unguis tenuibus linearibus 3 mm. longis), supra unguem leviter auriculatae, laminis 9 mm.

longis 4 mm. latis apice obtusis. Carina angustata incurvata rostrata unguiculata, unguibus 3 mm. longis, laminis circ. 10 mm. longis 2 mm. latis. Ovarium cylindraceum complanatum 3 mm. longum apice angustatum ad stylum aubeum, 2-ovulatum, pubescens, stylo 10 mm. longo supra medium incrassato. Legamina complanata, membranacea, reticulato-venosa, unisperma.

HAB. Toroku: Tonpozan, leg. T. KAWAKAMI (No. 1289).

Lespedeza macrocarpa HAYATA Mater. Fl. Formos. p. 79, (non BUNGE),

Very near *L. macrocarpa* BUNGE, but quite distinguishable from it by the much longer lobes of the calyx and in having always obovato-oblong emarginate leaves.

Mucuna ADANS.

***Mucuna acuminata* GRAH.?**

HAB. Kōtōshō.

Owing to the imperfectness of the specimens, the determination is very doubtful.

***Mucuna hainanensis* HAYATA sp. nov.** Rami superiore volubiles, ramiculis teretibus glabris multo-sulcatis apice circuliferis. Folia 3-foliolata, foliolo terminali obovato-oblongo chartaceo 6½ cm. longo 3½ cm. lato apice breve cuspidato ad summum obtuso ad centrum apicis mucronato, mucronibus 1 mm. longis, utraque page subglabro vel tenuissime paucissime hirsuto, costis supra impressis subtus tenuiter elevatis, venis lateralibus utroque latere 4-5 tenuissimis, vel subtrinervio margine subintegro basi obtuso, petiolulo 3 mm. longo, stipellis linearifiliformibus 3 mm. longis, foliolis lateralibus obliquis basi ± rotundatis vel subcordatis, rhachidibus 13 mm. longis, petiolis communibus 3 em. longis subteretibus basi ± incrassatis, stipulis linearilanceolatis 3 mm. longis. Racemi axillares folio ± longiores solitarii 10 cm. longi laxi-florati, bracteis magnis alabastrum floris amplectantibus oblongis 2 cm. longis pubescentibus, pedicellis 1 cm. longis sericeo-pubescentibus. Calyx sericeo-hirsutus pilis circ. 3 mm. longis fulvis dense obtectus, late globoso-campanulatus, alte 5-lobatus, 2-posterioribus conniventibus,

lubo antico longissimo cuspidato-triangulari 13 mm. longo 7 mm. lato apice acuto intus hirsuto, lateralibus antico minoribus 9 mm. longis 4 mm. latis. Vexillum brevius, carinas dimidium aequans, orbiculare $2\frac{1}{2}$ em. longum totiusque latum apice rotundatum vel plicato-emarginatum basi breve auriculatum, auriculis truncatis, ungue brevissimo 3 mm. longo 2 mm. lato; alæ oblique oblongo-lanceolatae 5 cm. longæ 1 cm. latae basi latere superiore auriculatae, unguibus 5 mm. longis; carinæ cum alis aequilongæ prope apicem recurvæ apice breve rostratae aculeato-acutæ linear-lanceolatae 6 mm. latae, latere basi superiore auriculatae, unguibus 7 mm. longis. Stamina diadelpha, cum carinis aequilonga, filamentis prope apicem subito superne flexis elevato-inerassatis, antheris hirsutis. Ovarium sessile, dense hirsutum lineare 6 mm. longum, stylo filiformi 4 cm. longo apice \pm incrassato, partibus incrassatis 1 cm. longis glabris.

HAB. Hainan, leg. Z. KATSUMADA, 1911.

Remarkable for the small size of the leaves.

Mucuna membranacea HAYATA sp. nov. Ramuli validiusculi scandentes glabri striati teretes. Folia 3-foliolata, foliolo terminali ovato-rhomboideo, membranaceo 9 cm. longo 6 cm. lato apice obtuso breve cuspidato basi cuneato-acuto utraque pagine hirsuto 3-nervio, nervis et venis lateralibus supra tenuiter subtus prominente elevatis, petiolulis 6 mm. longis hirsutis, stipellis et stipulis linear-setosis 3 mm. longis, foliolis lateralibus eo terminali aequilongis valde obliquis latere superiore $2-2\frac{1}{2}$ em. latis basi acutis, latere inferiore $4-4\frac{1}{2}$ em. latis basi latissime truncatis, petiolis communibus foliolo aequilongis, rhachidibus (inter petiolulum terminalem et petiolum) 2 cm. longis subglabris. Racemi axillares solitarii, bracteis non visis. Calyx late campanulatus, (tubo 1 cm. longo 2 cm. lato), villosopubescentis longe ferrugineo-pilosus 5-dentatus, dentibus posterioribus conuatis brevissimis, antico longissimo cuspidato lanceolato basi 3 mm. lato 12 mm. longo, lateralibus \pm brevioribus 8 mm. longis basi 4 mm. latis acutis. Vexillum late triangulo-cordatum 3 cm. latum 28 mm. longum apice obtusum subretusum basi auriculatum, auriculis $\frac{1}{2}$ em. longis 4 mm. latis truncatis, ungue 4 mm. longo 3-4 mm. lato dorso gibboso-inflato; alæ elongato-

oblongo-lanceolatae 4½ cm. longæ 14 mm. latae oblique apice obtusæ, laminis basi latere superiore auriculatis, unguibus ½ cm. longis margine dense ciliatis; carinæ cum alis æquilongæ a basi usque ad supra medium rectæ, supra medium prope apicem subito superne reflexæ apice acutæ ad summum rostratae ± reflexæ subcartilagineæ linearis-lanceolatae supra medium latissimæ 7 mm. latae, laminis basi latere superiore auriculatis, unguibus 1 cm. longis linearibus margine superiore ciliolatis. Stamina diadelpha, antheris dimorphis, filamentis versus apicem claviformibus ad summum longe apiculatis, ad apicem apiculorum antheras gerentibus. Ovarium lineare pilosum, stylo filiformi.

HAB. Kōtōshō, leg. S. KUSANO, (Fl.); leg. G. NAKAHARA, Feb. 1906.

Mucuna subferruginea HAYATA sp. nov. Scandens, rami subteretes, cortice subcinerascenti rugoso, lenticellis elevatis notati. Folia 3-foliolata, foliolo terminali oblongo-ovato apice obtuso ad summum apiculato (apiculis 3-4 mm. longis vel deciduis) basi obtuso 10 cm. longo 6½ cm. lato, subtrinervio vel pinniveno, in exsiccato supra subglabro nigricanti subtus fulvo-fuscato tomentoso, ad costam et venas dense fulvo-hirsuto, margine integro, chartaceo vel chartaceo-membranaceo, petiolulo 8 mm. longo, foliolis lateralibus eo terminali æquilongis, latere superiore 2½ cm. latis, latere inferiore 4½ cm. latis, basi late truncatis, petiolis communibus 7-8 cm. longis gracilibus dense fulvo-tomentosis, stipulis triangulari-lanceolatis 6 mm. longis 2 mm. latis acutis extus dense pilosis intus glabris. Racemi ad ramos defoliatos lateraliter siti penduli, rhachidibus gracilibus 20 cm. longis dense brevissime fusceto-tomentosis, floribus 6-7 cm. longis. Calyx late campanulatus basi superne sub-gibbosus, tubo 1½ cm. longo 2 cm. lato, ore 5-dentato, dentibus posterioribus connatis brevissimis, antice euspidiformi 1 cm. longo basi 7 mm. lato, lateralibus triangularibus brevioribus 5 mm. longis basi 6 mm. latis, extus sericeo-villosis simul longe fulvo-pilosis, intus sericeo-pubescentibus. Vexillum orbiculare 4 cm. latum totiusque longum apice obtuso-rotundatum, basi auriculato-cordatum breve unguiculatum, unguibus 3 mm. longis; alæ semiobovatae, 6 cm. longæ 23 mm. latae, apice rotundatae, basin versus angustatae basi latere superiore auriculatae, (auriculis ½ cm. longis apice obtusis) latere margine inferiore curvatae latere superiore margine rectæ, extus basin ± hirsutæ, unguibus

6-7 mm. longis 3 mm. latis basi recurvis; carinæ alam in longitudine \pm superantes, recurvato-oblanceolatae, 7 em. longæ 13 mm. latæ, apice breve rostratae ad summum cartilagineæ, supra medium usque ad basin rectæ, latere inferiore brevissime minutissime auriculatae, unguibus 6 mm. longis linearibus. Stamina diadelpha cum carinis æquilonga. Ovarium lineare complanatum 2 em. longum 1 $\frac{1}{2}$ mm. latum, apice gradatim in stylum abeuns, paree hirsutum, stylo filiformi basi hirsuto apice glabro.

HAB. Akō: Mt. Buisan, ad 5000 ped. alt., leg. S. SASAKI, 1910, Mart. (Fl.).

Mucuna Tashiroi HAYATA sp. nov. Scandens. Rami et ramuli subteretes, leviter sulcati, læves, in exsiccato fuscantes, sursum tenues subpilosi, pilis ferrugineis. Folia 3-foliata, in circumscriptione late triangularia 15-20 cm. lata 15 cm. longa (petiolis exceptatis), foliolo terminali æquilato oblongo apice subito acuminato basi emarginato-obtuso membranaceo vel coriaceo 10-12 em. longo 5-7 em. lato supra tenuiter ferrugineo-piloso subtus subglabro vel utraque pagine subglabro vel glaberrimo pinnimervio vel subtrinervio, margine subintegro, petiolulo quam petiolis crassiore 7 mm. longo, foliolis lateralibus valde obliquis ovatis eire, 10 cm. longis 6 cm. latis apice subito acuminato-acutis basi late obtusis, latere superiore 2 cm. latis latere inferiore 4 cm. latis, subtrinerviis rhachidibus (inter petiolos et petiolulos terminales) 2 cm. longis supra leviter sulcatis, petiolis teretibus 4 $\frac{1}{2}$ cm. longis basi incrassatis, partibus incrassatis 12 mm. longis 4 mm. in diametro, stipulis cuspidato-lanceolatis 3-4 mm. longis 1 mm. latis apice acuminatis basi obtusis latissimis hirsutis, stipellis cuspidato-linearibus 1-2 mm. longis. Racemi axillares longe pedunculati penduli, sursum florem dense subcapitate subcymose gerentes, pedunculis longissimis 12 cm. longis glabris recurvis pendulis partibus florigeris 3 cm. longis dense floratis, pedicellis ad nodos 3-5 fasciculatis (vel ad ramos brevissimos pedunculorum) longiusculis 2 cm. longis pendulis, bracteis pedunculorum et pedicellorum eadueissimis non visis. Flores longe pedicellati 3 $\frac{1}{2}$ cm. longi basi 2-bracteolati, bracteolis magnis alabastria florum amplectantibus deciduis oblique lanceolato-oblongis concavis apice obtusis basi obtusis paralleliter multinervis crassiuseculis intus tenuiter brevissimeque

pubescentibus extus pilis longiusculis ferragineis parce obtectis vel subglabris. Calyx late saccato-campanulatus 12 mm. longus 17 mm. latus basi obliquus, latere superiore subgibbosus, latere inferiore non gibbosus, ore 5-dentatus, dentibus latis brevibus obtusis, dente infimo breve obtusus euspidiformi, sinibus inter dentes late rotundatis. Petala albo-viridia, (fide TASHIRO). Vexillum crassiusculum obovatum unguiculatum, cum unguibus 3½ em. longum 2½ em. latum, lamina late obovata 27 mm. longa 25 mm. lata apice tenuiter emarginato-lobata (lobis rotundatis brevissimis 2 mm. longis, sinibus inter lobos 2 mm. longis acatis) basi truncata utroque latere basi auriculata (auriculis brevissimis paralleliter multinervia prope medium vel infra medium flexuosa, ungue 6 mm. longo 4½ mm. lato apice campanulato-dilatato, auriculis crassiusculis. Alae cultriformes cum unguibus 3½-4 em. longæ 11 mm. latæ, laminis semi-oblongis 3 em. longis 11 mm. latis facie plicato-repandis apice obtusis basi latere superiore auriculatis, (auriculis crassatis triangulari-oblongis 5 mm. longis totiusque latis), intus lamella una instructis extus hirsutis, unguibus 13 mm. longis cuneiformibus apice latioribus 6 mm. latis utroque latere margine hirsutis basi recurvis. Carinæ naviculiformes, sursum latiores deorsum angustiores cum unguibus 3½ em. longæ 9 mm. latæ, laminis naviculiformibus 28 mm. longis 9 mm. latis apice cartilagineis acutis facie basi saccato-gibbosis latere superiore auriculatis, unguibus subcuneiformibus 1 em. longis apice 4 mm. latis margine ciliatis. Stamina diadelpha, filamentis 3 em. longis, (in partibus liberis) complanatis, altris 5 validioribus, altris 5 tenuibus, antheris filamentorum validiorum oblongis 1½ mm. longis basi facieque barbatis versatilibus, antheris filamentorum tenuium oblongo-linearibus 2½ mm. longis glabris versatilibus. Discus dentatus, dentibus 10, approximatis obtusis. Ovarium oblongo-lineare, 6 mm. longum complanatum hirsutum, stylo filiformi apice infra stigmata constricto, stigma semiglobosum.

HAB. Kōshūn: collibus prope Kuraru Aprili. 1909, leg. Y. TASHIRO (Sp. Fl.).

Dalbergia LINN.

Dalbergia Hancei BENTH. ? Fl. Hongk. p. 93.

HAB. Fokien: Usukisan, Nov. 14, 1909, leg. S. NAGASAWA.

Derris LOUR.***Derris alborubra*** HEMSL. in Bot. Mag. t. 8003.

HAB. Hainan, leg. Z. KATSUMADA, 1910.

Derris hainanensis HAYATA sp. nov. Ramuli teretes multi-striati, glabri. Folia impari-pinnata, in ambitu oblonga 8 cm. lata, 13-15-foliolata, foliolis membranaceis obovato-oblongis 4 cm. longis 18 mm. latis apice rotundatis breve cuspidatis, (cuspidibus 1-2 mm. longis ad summum obseure mucronatis), basi obtusis margine integris utraque glabris, costis utraque pagine leviter elevatis, venis lateralibus tenuibus distinete visis, facie sub lente minute denseque tuberculatis vel reticulatis, petiolulis 5 mm. longis, petiolis communibus 7 cm. longis, stipulis oblongo-triangularibus apice obtusis basi \pm infra insertionem productis truncatis extus tomentosis intus glabris crassiusculis. Flores racemosi vel paniculati, racemis axillaribus vel solitariis 10 cm. longis laxifloratis, pedunculis 5 cm. longis, pedicellis 1-2 cm. longis, bracteis minutis triangularibus globosis apice acutis basi rotundatis extus hirsutis margine ciliolatis intus glabris crassiusculis; basi pedicelli bracteis 1, apice pedicelli bracteis 2 dispositis. Calyx campanulato-cupuliformis, 4 mm. longus 7 mm. latus subglaber prope marginem tenuiter pubescens, ore subtruncatus, obseure brevissime 5-dentatus. Vexillum suborbiculare, 1 $\frac{1}{2}$ cm. longum, apice lobato-emarginatum, basi cordatum breve unguiculatum, ungue 3 mm. longo cuneiformi basi 1 mm. lato apice 2 $\frac{1}{2}$ mm. lato basi laminae squamis 2 dispositis, squamis triangulari-cuspidiformibus, 2 mm. longis; aiae 1 $\frac{1}{2}$ cm. longæ, laminis oblique oblongis 11 mm. longis 4-5 mm. latis apice obtusis basi latere superiore auriculatis, unguibus 5 mm. longis linearibus; carinæ cultriformes alis aequilongæ 1 $\frac{1}{2}$ cm. longæ, laminis oblique oblongis 10 mm. longis infra medium gibboso-inflatis cum alis confluentibus, unguibus linearibus 6 mm. longis. Ovarium sessile lineare 11 mm. longum 1 mm. latum complanatum hirsutum apice gradatim ad stylum 1-2 mm. longum abeuns, stigmate terminali globoso.

HAB. Hainan, leg. K. KATSUMADA, 1911.

Near *D. oblonga*, but differs from it by the quite glabrous calyx and leaves.

Derris lasiantha HAYATA sp. nov. Rami subglabri rugosi, cortice rubro-fuscenti lenticellis rubris rotundatis notato. Folia 5-foliolata, foliolo terminali majore oblongo-elliptico 7 em. longo 27 mm. lato utrinque obtuso vel apice breve cuspidato-obtuso coriaceo, (costis supra impressis subtus elevatis, venis lateralibus supra leviter subtus prominente elevatis, venulis reticulatis), utraque page glabro, petiolulo 2 mm. longo transverse rugoso \pm hirsuto, stipellis setosis 1-1½ mm. longis, foliolis lateralibus terminali conformibus sed minoribus, petiolis cum rhachidibus 7 em. longis supra sulcatis basi incrassatis, jugis a se 2 cm. remotis. Spicæ paniculatae terminales, rhachidibus dense sericeo-pubescentibus, pedicellis 4-5 mm. longis cum calyce continuis cum rhachidibus articulatis, bracteis basi pedicelli brevissimis 2 mm. latis $\frac{1}{2}$ mm. longis dense sericeo-pubescentibus, pedicellis sericeo-pubescentibus, glandulis 2 instructis. Calyx campanulatus dense sericeo-pubescentis 4-dentatus, ore obliquo. Vexillum obovatum 2½ em. longum 17 mm. latum apice rotundato-emarginatum basi ad unguem contractum, (unguis 3 mm. longis 2 mm. latis), intus glabrum, extus sericeo-pubescentis. Stylus valde reflexus.

HAB. Nantō: Sōtō, leg. Y. SHIMADA, Aug. 1907, (No. 1234).

Derris lasiopetala HAYATA sp. nov. Rami subrecti teretes subglabri vel tenuiter pubescentes sublaeves vel longitudinaliter subrugosi lenticellis minutis parce notati. Folia majuscula circ. 40 cm. longa 9-11-foliolata, foliolo terminali elongato-elliptico 16 cm. longo 6½ cm. lato utrinque obtuso chartaceo vel chartaceo-coriaceo margine subintegro vel suberoso supra glabro subtus fulvo-sericeo-pubescenti, venis lateralibus 15-16, costis et venis lateralibus gracilibus supra impressis ad marginem attingentibus subtus elevatis, venis \pm curvatis, venulis inter venas suboblique transversis, petiolulis 7-8 mm. longis subteretibus supra planis pubescentibus, stipellis subulatis 3 mm. longis, foliolis lateralibus eo terminali conformibus ad basin euneato-obtusis subobliquis, petiolis communibus 10 cm. longis foliolo brevioribus basi \pm incrassatis pubescentibus teretibus, stipulis oblique lanceolato-triangularibus 6-7 mm. longis apice acuminatis basi 3 mm. latis. Racemi 10-20 cm. longi folio breviores panicí-ramosí vel simplices, rhachidibus ramis pedicellis calycibusque fulvo-sericeo-pubescentibus, bracteis cum stipulo conformibus

sed multo minoribus, pedicellis 6 mm. longis. Calyx (basi 2 bracteolis instructus, bracteolis subrotundatis $1\frac{1}{2}$ mm. in diametro extus tomentosis intus glabris), late oblique campanulatus 4 mm. longus 5 mm. latus extus pubescens intus glaber, ore late 5-dentatus, dentibus posterioribus connatis apice rotundatis $\frac{1}{2}$ mm. longis, antice longissimo trianguli-acuto $1\frac{1}{2}$ mm. longo. Vexillum extus dense sericeo-fulvo-tomentosum intus glabrum multinervium unguiculatum, lamina orbiculari 9 mm. in diametro apice rotundata intus versus apicem \pm plicata margine integra basi late truncata, ungue linearis 2 mm. longo $\frac{1}{2}$ mm. lato incrassato intus sulcato; alae 13 mm. longæ oblique obovato-oblongæ, laminis 9 mm. longis 3-4 mm. latis apice rotundatis basi \pm angustioribus utroque latere breve auriculatis margine subintegris latere superiore deorsum erosion extus basi hirsutis et apice marginem ciliolatis, unguibus subulatis linearis-cuneatis 3 mm. longis 1 mm. latis versus costam hirsutis; carinæ cum alis æquilongæ, laminis oblique ovato-oblongis extus parce hirsutis 6-7 mm. longis 6 mm. latis apice truncatis oblique rotundatis ciliolatis margine latere superiore suberosa latere inferiore integerrimis basi latere superiore truncatis latere inferiore rectis ad unguem abeuntibus, unguibus linearibus $4\frac{1}{2}$ mm. longis 1 mm. latis recurvato-rectis. Stamina diadelpha, a basi usque ad infra apicem recta prope apicem sabito postice inflexa glabra. Ovarium linearis-ovoideum plus 4 mm. longum basi latissime 1 mm. latum apice attenuatum ad stylum abeuns dense pilosum basi breve stipitatum, stylo basi piloso superne glabro subito reflexo, stigmate terminali punctiformi.

HAB. Hainan, leg. N. KONISHI, 1909, Juli.

Pongamia VENT.

Pongamia taiwaniana HAYATA n. n. = *Galedupa taiwaniana* HAYATA = *Derris taiwaniana* MATSUM. in Sched. Frutex. Caulis erectus 1-2 m. altus, cortice rubro-fulvescenti, maximus 10 cm. in diametro, medioeris 5 cm. in diametro, basi eramosus supra medium ramosus, ramulis superioribus scandentibus sinistrorso-volubilibus, cortice ramulorum in exsiccato rubro-fusco-nigricanti. Folia alterna impari-pinnata, 15-13-foliolata, foliolis oblongo-oblanceolatis 4.5-5 cm. latis quam latis 3-plo longioribus; novella pallido-fulvescentia sericeo-pubescentia, apice acuminata, margine integra, estipellata. Flores racemosi,

racemis axillaribus 2-4-fasciulatis pedicellis 1 cm. longis floribus 2-3-fasciulatis, bracteis obsoletis, petalis ad marginem purpurascens. Calyx breve cylindricus, apice subtruncatus, 5-dentatus, dentibus posterioribus subobsoletis, 3-anterioribus conspicuis, medio plus conspicuo. Vexillum obovoideum apice emarginatum; alæ leviter longiores medio cum carinis tenuiter conniventes; carinae apice liberae, basi distinetæ. Stamen vexillo oppositum liberum, cætra connata. Stylus filiformis postice recurvus, antice deorsum ciliolatus; stigma terminale, punctiforme; ovarium sessile, ovoides 5. Fructus oblongi subcomplanati ± obliqui 4 cm. longi 3 cm. lati 23 mm. crassi 1-spermi exalati lignosi extus dense tuberculati, prope suturam sublaeves et obseure costati, in maturo rarius ad suturam inferiorem dehiscentes, apice rotundati ad summum breve apiculati, basi obtusi vel breviter stipitiformes angustati medio sensim et obseure tenuissime vix vel haud constricti, pedicellis 1 cm. longis validis. Semina obreniformia 3 cm. longa $2\frac{1}{2}$ cm. lata; testa nitida nigricans, ad apicem medio et ad centrum profunde impressa; cotyledonibus amplis late oblongis 3 cm. latis 22 mm. longis basi profunde cordatis, sinibus 14 mm. longis; radicula obsoleta.

HAB. Sankakuyū, leg. K. NAGAI, 1902.

The present plant is one of those leguminous plants which afford a poisonous matter used for fishing by the aborigines in Formosa. It was first labelled by Prof. J. MATSUMURA as *Derris chinensis* BENTH. Soon after, the professor regarded the plant different from BENTHAM's species and named it *D. taiwaniana*. The same plant was studied by Dr. K. NAGAI who regarded it to be referable to *Lonchocarpus* or more probably to *Couplandia*, but not to *Derris*. He then expressed this opinion in a number* of the Journal of the Tōkyō Chemical Society. In my opinion, the plant certainly does not belong to *Derris* on account of its wingless fruits; nor should it be referred to *Lonchocarpus*, for the plant has a sessile ovary, but has neither elongated pod nor broadened suture. It is also different from *Couplandia* in having neither torulose nor rounded pods. A genus to which the present plant should probably be referred is, in my opinion, *Pongamia*, as is seen from the structure of the fruits. The descriptions of

* Journal of the Tōkyō Chemical Society XXIII —7, pp. 744-777 (Japanese).

the flowers above given are mainly based upon the account given by Dr. K. NAGAI in his paper above referred to.

Euchresta BENN.

Euchresta Horsfieldii BENN. var. **formosana** HAYATA n. v. (Tab. XVI.) = *Euchresta Horsfieldii* HAYATA Ic. Pl. Formos. I. p. 207, (non BENN.). Suffrutex 50–100 cm. alta, non ramosa vel pauciramosa, ramis sursum foliosis zigzag-forme flexuosis, sursum teretibus 3–4 mm. in diametro glabris, apice tenuissime fulvo-pubescentibus. Folia impari-pinnata, cum petiolis 20 cm. longa 14 cm. lata, in ambitu oblonga, foliolis 5–4 omnibus conformibus, foliolis lateralibus oppositis, chartaceo-membranaceis, oblongis vel oblongo lanceolatis, apice acuminatis, basi obtusis, 10 cm. longis 3 cm. latis, supra viridissimis subtus pallidioribus, margine integris, costis tenuissime impressis, subtus elevatis, venis et venulis non distinctis, petiolulis 2 mm. longis, petiolis communibus foliolo brevioribus teretibus supra late sulcatis vel subalatis glabris, jugis foliolorum 3–4 cm. a se remotis. Racemi terminales, circ. 15 cm. longi, pedunculis 3 cm. longis dense floratis, rhachidibus et floribus brevissime fulvo-pubescentibus, pedicellis 6–2 mm. longis, bracteis basi pedicelli lanceolatis minutis 2 mm. longis. Calyx longe campanulatus, 8 mm. longus apice 6–7 mm. latus, basi obtusus, basi superiore gibbosus, apice breve 5–dentatus, (dentibus latis obtusis), extus intusque brevissime pubescens. Petala 5, supra basin calycis sita; vexillum spathulatum 1½ cm. longum basi 2 mm. latum, apice 2-lobatum vel emarginatum, 5½ mm. latum, (lobis rotundatis), deorsum gradatim angustatum, non unguiculatum subplicatum ± recurvum integrum basin extus intusque pubescens; alae recurvæ cultriformes unguiculatæ, laminis semioblongis latere superiore rectis latere inferiore curvis basi latere inferiore auriculatis 9 mm. longis 3 mm. latis, unguibus linearibus 6 mm. longis ¾ mm. latis glabris; carinæ recto-cultriformes 13 mm. longæ, laminis semioblongis 8 mm. longis 4 mm. latis apice obtusis latere inferiore curvis latere superiore subrectis basi auriculatis, unguibus 5½ mm. longis ¾ mm. latis linearibus. Stamina diadelpha, eo vexillo opposito libero, cætris connatis, tubo filamentorum calycis basi connato, filamentis cum carina æquilongis basi extus pubescentibus, antheris versatilibus oblongis. Ovarium complanatum obovato-lineare,

5 mm. longum apice rostratum erecto-recurvum, (stigmate punctiformi), basi longe stipitatum, stipite 7 mm. longo glabro recto. Fructus ovoides 22 mm. longi nitidi nigricantes 1-spermi apice breve apiculati, stipitibus 1 cm. longis validiuseulis.

HAB. Kusukusu, Arisan, Sinsuiye, leg. S. SASAKI et B. HAYATA (Aug. Fl., Feb. Fr.), 1912.

Differs from the type in having purplish white flowers with sessile (not unguiculate) standards, much smaller leaflets and larger fruits. The plant was formerly regarded by myself as the same as the type; but a more close examination in the fields has led me to think it better to regard it as a variety of the type.

Sophora LINN.

Sophora flavesiensis AIT. var. **stenophylla** HAYATA n. v. Caulis subcomplanatus vel teres prominente sulcatus, glaber. Folia alterna impari-pinnata in ambitu lanceolata, 20-25 cm. longa 5-6 cm. lata, 25-29-foliolata, foliolis suboppositis vel ± alternis jugis a se 1½-2 cm. remotis, linearilanceolatis 37 mm. longis 6 mm. latis apice acuminatis mucronatis basi obtusis margine integris supra subglabris vel brevissime pubescentibus subtus villoso-adpresso-pubescentibus, costis supra impressis subtus elevatis, venis primariis lateralibus non conspicuis, supra in exsiccato fuscentibus subtus pallido-fulvescentibus, petiolulis 1½ mm. longis pubescentibus, rhachidiis teretibus sulcatis, petiolis communibus 2 cm. longis basi complanatis ± dilatatis. Racemi terminales erecti 18 cm. longi, pedunculis 2 cm. longis simplicibus vel rarius ramosis, pedicellis 6 mm. longis pubescentibus. Calyx oblique campanulatus 6-7 mm. longus basi latere superiore gibbosus ore oblique truncatus obscure 5-dentatus, 2-posterioribus latissimis, 3-anterioribus minoribus extus tenuiter pubescentibus. Petala 5 supra basin tubi calycis affixa. Vexillum spatulatum 1½ cm. longum 5-6 mm. latum apice emarginatum a medio deorsum angustato-unguiforme, unguibus 7 mm. longis 2½ mm. latis; alæ cultriformes (laminis semi-oblongis), 13 mm. longæ, unguibus basin subtibo recurvis; carinæ cum alis aequilongæ, laminis recurvato-oblongis 6 mm. longis basi latere superiore auriculatis, unguibus 6 mm. longis linearibus.

Stamina 10, supra basin distincta basi pubescentia. Ovarium stipitatum hirsutum, stylo ascendentí, stigmate punetiformi.

HAB. Chokansan, leg. U. MORI, Aprili. 1901.

Differs from the type by the much narrower leaves and smaller flowers.

Sophora tetragonocarpa HAYATA sp. nov. Rami complanato-subteretes, glabri flavescentes facie late obscureque sulcati. Folia in ambitu oblonga, alterna, 15–20 cm. longa cum foliolis 10 cm. lata, circ. 15-foliolata, foliolis suboppositis vel ± alternis, terminali lateralibus conformi lanceolato 6 cm. longo apice obtuso-mucronato (mucronibus brevissimis) basi obtuso chartaceo vel chartaceo-coriaceo margine integerrimo in exsiccato supra fusco nigricanti subtus pallido-fulvescenti supra glabro subtus pubescenti supra tenuissime impresso-reticulato, costa supra impressa subtus prominenti, venis primariis lateralibus utraque pagina non conspicuis, subtus venulis minute reticulatis visis, petiolulis brevissimis 2 mm. longis tenuiter pubescentibus, rhachidibus gracilibus teretibus supra anguste profundeque sulcatis, petiolis communibus foliolum $\frac{1}{3}$ plo in longitudine aequalibus $1\frac{1}{2}$ cm. longis supra tenuiter sulcatis basi ± incrassatis, jugis foliolorum a se $1\frac{1}{2}$ cm. remotis. Racemi fructiferi 20 cm. longi. Legumina moniliformia, (monilibus 2–3–4), subcomplanato-tetragono-angulata, ad angulus obtusa subglabra apice longe rostrata, (rostris nunc longissimis nunc brevibus apice acutis) basi stipitata, stipitibus 8 mm. longis, monilibus nunc proximis nunc remotis ad nodos constrictis distinctis vel confluentibus 2-valvatum vel ad suturam inferiorem dehiscentibus, pedicellis 5–7 mm. longis. Semina lœvia suboblique complanato-oblonga $4\frac{1}{2}$ mm. longa, facie minus convexa, dorso plus convexa.

HAB. In regionibus montanis, leg. U. MORI, Juli. 1909.

Near *G. flavescens* AIR., but differs from it in having larger lanceolate leaves and dehiscing 4-angled moniliformed pods.

Bauhinia LINN.

Bauhinia erythropoda HAYATA sp. nov. Ramuli superiores rubro-ferrugineo-tomentosi. Folia cordata, circ. 6 cm. longa, $6\frac{1}{2}$ cm. lata, apice acute 2-loba, (sinibus inter lobos $2\frac{1}{2}$ cm. longis acutis, lobis apice obtusis latere

exteriore recurvis latere interiore rectis), basi cordata supra glabra nitida subitus ad nervos ferrugineo-tomentosa 9-nervia, venulis supra elevato-reticulatis subitus planis, petiolis lamina aequilongis 5 cm. longis rubro-ferrugineo-tomentosis apice basique incrassatis, stipulis obovatis obtusis extus ferrugineo-rubro-tomentosis intus glabris. Racemi terminales circ. 10 cm. longi 15 cm. lati, pedicellis longissimis divaricatis 4-5 cm. longis, bracteis linearibus 5 mm. longis acuminatis extus tomentosis intus nigricantibus, rhachidibus et pedicellis tomentosis, pedicellis superiore bracteis minoribus 1-2 instructis. Calyx tubus cylindraceus 1 cm. longus \pm obliquus 2 mm. latus, limbus 5-fidus, lobis lanceolatis 12 mm. longis 3½ mm. latis cum tubo extus tomentosis intus glabris 3-nerviis. Stamina matura 3, filamentis ad orem tubi calycis affixis 1½ cm. longis basi validiusculis apice tenuissimis basi dense hirsutis suorum glabris, antheris oblongo-linearibus 5½ mm. longis 2 mm. latis versatilibus. Ovarium stipitatum, stipite cum latere calycis tulii adnato. Petala 5 obovata 23 mm. longa 12 mm. lata apice \pm emarginata basi subito unguiculata (unguis 5 mm. longis) margine crispata extus parce hirsuta intus glabra, unguibus utroque latere hirsutis. Ovarium complanatum obliquum dense fulvo-rubro-hirsutum, stylo flexuoso glabro, stigmate dilatato \pm peltato.

HAB. Hainan, leg. Z. KATSUMADA, 1910.

Near *B. ferruginea* ROXB., but differs from it by the oblong unguiculate petals.

Bauhinia longiracemosa HAYATA sp. nov. Ramuli graciles flexuosi, tenuiter pubescentes fusco-nigricantes. Folia alterna cordata chartacea vel chartaceo-coriacea trianguli-cordata 8-9 cm. longa 7-7½ cm. lata apice late obtusa et tenuiter retusa, ad centrum mucronata, basi late et leviter cordata, margine subintegra, 7-nervia, supra tenuiter subitus distincte elevata, supra nitida subitus pallidiora, ad medium secundum costam subplicata, petiolis 2½-3 cm. longis apice basique incrassatis fusco-nigricantibus gracilibus, stipulis deciduis minutis oblongis obtusis. Racemi subterminales 20 cm. longi 3 cm. lati, pedunculis 6 cm. longis, pedicellis 1 cm. longis basi 1 bracteis instructis, bracteis cuspidatis 1½ mm. longis rhachidibus et pedicellis sericeo-pubescentibus. Calyx-tubus campanulatus 2 mm. longus

2½ mm. latus intus discis impletus, lobis 5 triangulari-lanceolatis 3½ mm. longis basi 1½ mm. latis intus glabris extus pubescentibus. Petala 5 ad orem calycis tubi affixa 5½ mm. longa unguiculata, unguibus 1½ mm. longis, laminis oblongis facie margineque crispatis extus dorso tenuiter pubescentibus. Stamina 5, 3 fertilia 2 abortiva, filamentis staminum fertiliū validiusculis 1 em. longis glabris, antheris oblongo-linearibus 2½ mm. longis. Ovarium stipitatum, stipitibus ad laterem tubi calycis adnatis, partibus liberis supra calycis tubum 1 mm. productis. Ovarium complanatum 2-3 em. longum recurvum ad suturas inferiorem et superioriem hirsutum, stylo ± recurvo 1½ mm. longo validiusculo, stigmate terminali.

HAB. Shintiku, Taihei, leg. Y. SHIMADA, Oct. 1907. (No. 5759).

Near *B. Championi* BENTH., but differs from it by the longer terminal racemes having larger flowers with longer petals.

Intsia THOU.

Intsia Tashiroi HAYATA = *Afzelia Tashiroi* HAYATA. Frutex, ramis teretibus fulvo-cinerascentibus glabris minute lenticellatis, flexuosis. Folia paripinnata, 2-juga, foliolis oblique oblongis, 7 em. longis 38 mm. latis, chartaceo-membranaceis apice obtusis, basi rotundato-aenatis, latere superiore 23 mm. latis, latere inferiore 1½ em. latis, (costis curvatis supra minus subtus plus elevatis), utraque pagine glabris, venis et venulis utraque pagine distinete elevatis grosse reticulatis, margine integris vel ± undulatis in exsiccato fulvo-viridescentibus subtus ± pallidis, vel subconcoloris, margine nervo-marginatis, petiolulis 5 mm. longis, rhachidibus 23 mm. longis glabris complanatis tenuissime sulcatis, petiolis communibus 1½ em. longis ± complanatis supra tenuissime sulcatis basi dilatatis. Flores cymosi, cymis terminalibus 5 em. longis totiusque latis, pedunculis 2 em. longis multi-ramosis, pedicellis infra calycem articulatis, bracteis et bracteolis non visis. Calycis tubus discifer elongatus tubiformis 5 mm. longus ½ mm. latus, segmentis 4 parum inaequalibus oblongis 5 mm. longis omnibus pubescentibus valde imbricatis. Petalum 1, unguiculatum glabrum orbiculari-reniforme, 6 mm. latum 4 mm. longum margine undulato-plicatum, ungue 2 mm. longo hirsuto. Stamina 3 declinata, filamentis elongatis 1½ em. longis hirsutis, antheris oblongo-linearis

bus $2\frac{1}{2}$ mm. longis, loculis longitudinaliter dehiscensibus. Staminodia 4, filiformia 1 mm. longa. Ovarium lineare 2 mm. longum ad suturam hirsutum stipitatum, (stipite calycis tubo hinc adnato), ∞ -ovulatum, stylo elongato.

HAB. Yämaya archipelago, leg. Y. TASHIRO.

Near *Afzelia bijuga* (*Macrolobium bijugum* COLEBR. in Tran. Lin. Soc. XII. t. 17), but differs from it in having much more obtuse leaves.

Acacia WILLD.

Acacia hainanensis HAYATA sp. nov. Rami teretes longitudinaliter striati, ferrugineo-rubro-pubescentes, spinosi, spinis rectis 2 mm. longis acutis basi dilatatis, horizontaliter rectis vel \pm recurvis. Folia alterna bi-pari-pinnata, in ambitu obovata, 10–20 cm. longa, 8 cm. lata, circ. 12-juga, jugum terminale brevius, id proximum juxta terminalem longissimum, iis inferioribus gradatim brevioribus, id inferius brevissimum, jugis longissimis in ambitu linearibus 6 cm. longis 12 mm. latis pari-pinnatis apice aristis 1 mm. longis terminatis basi truncatis, petiolulis $1\frac{1}{2}$ mm. longis, pinnulis 50–60-jugis linearibus \pm falcatis vel divaricato-rectis 6 mm. longis 1 mm. latis apice obtusis basi truncatis, costis eccentricis latere superiore angustissimis latere inferiore latioribus basi truncatis sessilibus, rhachidibus pinnarum angulatis hirsutis, rhachidibus foliorum gracilibus profunde sulcatis hirsutis ad insertiones jugorum supra glandulis cupuliformibus instructis, petiolis communibus 2–8 cm. longis subglabratris supra profunde sulcatis teretibus, (supra basin glandula una stipitata instructis, glandulis a axilla circ. 1 cm. remotis), basi incrassatis, stipulis minutis oblongis $1\frac{1}{2}$ mm. longis eaducissimis. Capitula florum cymosa, cymis terminalibus 5–10 cm. longis pyramidalibus divaricato-multi-ramosis, pedicellis 1–1 $\frac{1}{2}$ cm. longis solitariis vel geminatis vel ternatis basi bracteis instructis, bracteis divaricatis oblongis 2 mm. longis. Capitulum globosum 8 mm. in diametro, floribus ∞ , receptaculum hirsutum globosum $1\frac{1}{2}$ mm. in diametro, bracteis florum lineari-spathulatis 1 mm. longis apice hirsutis. Calyx campanulatus 5-lobatus 2 mm. longus glaber 5-lobatus, lobis oblongo-triangularibus circ. 1 mm. longis obtusis. Petala 5, sublibera, lanceolata, $1\frac{1}{2}$ mm. longa. Stamina ∞ , 2–2 $\frac{1}{2}$ mm. longa, filamentis crispatis glabris, antheris minutis. Ovarium ignotum.

HAB. Hainan, leg. Z. KATSUMADA, 1910.

Near *A. concinna* DC; but differs from it in having much smaller lanceolate stipules and much smaller leaves.

Albizzia DURAZZ.

Albizzia Juribrassin DURAZZ. FORBES. et HEMSL. Ind. Fl. Sin. I. p. 216.

HAB. Nantō: Torokō, leg. U. MORI, 1909, July.

Exactly agrees with the Japanese, Chinese and Corean, specimens preserved in the Tōkyō Herbarium.

DISTRIB. Persia to Japan and in eastern tropical Africa (HEMSLEY).

Rosaceæ.

Prunus LINN.

Prunus persica S. et Z. var. **Davidiana** CARR.

HAB. Cult?

Pygeum GEERTN.

Pygeum Preslii MERR.

HAB. Exact locality is not given (Herb. Taihoku Museum).

Rubus LINN.

Rubus arisanensis HAYATA sp. nov. Rami viridiusenli subrecti striati glabri aculeolati, aculeis descendento-recurvis longitudinaliter complanatis cuspido-triangularibus 4 mm. longis basi 4 mm. latis. Folia alterna, in ambitu cordato-ovata, 11 cm. longa 10 cm. lata, apice acuminata, basi leviter cordata, 3-lobata, (lobo terminali longissimo oblongo 8 cm. longo 3½ cm. lato apice acuminato basi ± contracto duplicato-serrulato, lobis lateralibus terminali brevioribus), 3-nervia, (nervis 55° a se divaricatis rectis, nervo centrali 10 cm. longo, nervis lateralibus 6 cm. longis), utraque pagine glabra subtus pallidiora supra ad nervos subplanos hirsuta, subtus nervis elevatis.

deorsum aculeolatis, sinibus inter lobos acutis, petiolis 3 cm. longis glabris aculeolatis, stipulis persistentibus, iis foliorum anteriorum minutis petiolis adnatis partibus liberibus $\frac{1}{2}$ mm. longis a axilla 4 mm. remotis, iis foliorum majoribus ensipidato-linearibus cum petiolis adnatis, partibus liberis 4 mm. longis minus 1 mm. latis. Gemmæ floriferæ laterales basi perulatae, perulis imbricatis ovatis cuspidatis vel late ovatis 4–8 mm. longis glabris vel apice hirsutis. Flores ad axillas foliorum ramulorum lateralium solitarii, vel ad apicem ramulorum lateralium terminales, breve pedicellati. Calyx subplanus, extus hirsutus, lobis patentibus cuspidato-triangularibus 12 mm. longis basi 5 mm. latis, apice longe cuspidatis, intus velutinosis. Petala 5, rhomboideo-ovata, 1 cm. longa 6 mm. lata, apice triangulari-acuta, basi cuneata basi $\frac{1}{2}$ mm. lata, margine subintegra. Stamina ∞ , filamentis $4\frac{1}{2}$ mm. longis complanatis $\frac{1}{3}$ mm. latis apice contractis glabris, antheris oblongis 1 mm. longis $\frac{2}{3}$ mm. latis, connectivis glabris. Receptaculum carpellorum cylindraceum circ. 2 mm. longum elevatum vel subeonicco-cylindraceum glabrum, carpella 4 mm. longa. Ovarium recurvum oblique obovoidatum subcomplanatum facie glabrum, dorso dense hirsutum, stylo basi hirsuto sursum glabro.

HAB. Montibus Arisan: Azumayama leg. B. HAYATA et S. SASAKI, Jan. 1912.

Near *R. Fauriei* and *R. palmatus*.

Rubus calycinoides HAYATA sp. nov. Suffrutex; caulis enermis scandens vel procumbens, radicans, cortice glabro tenuiter soluto, ramis lateralibus profusis sed semper brevioribus 3–4 cm. longis axillaribus. Folia coriacea, orbiculato-cordata, 2–2 $\frac{1}{2}$ cm. in diametro, supra glabra fuscentia subtus fulvo-floccoso-tomentosa, (supra venis et venuis impressis reticulatis subtus elevatis reticulatis), 5-lobata, (lobis latis apice rotundatis), margine denticulata, petiolis cum lamina æquilongis, stipulis palmiformibus vel obovatis apice laceratis 7 mm. longis 4 mm. latis intus glabris extus hirsutis tenuibus persistentibus. Flores ad apicem ramorum lateralium terminales, solitarii vel axillares, pedunculis brevibus dense hirsutis bracteis 3–4 instructis, bracteis stipulo conformibus. Calyx extus dense pilosus (pilis altris eglandulosis altris glandulosis), 5-lobatus, lobis ovatis 8 mm. longis 5 mm. latis apice sub-

laceratis vel integris extus dense hirsutis intus tenuiter villosis. Petala 5 latissime obovata rotundata, 5 mm. longa, 6 mm. lata, apice rotundata, basi late truncata, brevissime unguiculata, (ungnibus $\frac{1}{2}$ mm. longis $\frac{2}{3}$ mm. latis), palmato-multinervia, (nervis intus planis extus elevatis), intus glabra, extus paree ad medium hirsuta. Stamina 80, circ. 3 mm. longa, filamentis glabris $2\frac{1}{2}$ mm. longis complanatis $\frac{1}{2}$ – $\frac{1}{3}$ mm. latis apice contractis, antheris suborbicularibus margine longe barbatis $\frac{1}{2}$ mm. longis. Receptaculum carpellorum convexum pilosum. Carpella 80 sessilia 4 mm. longa. Ovarium semiobconiculatum $\frac{2}{3}$ mm. longum complanatum subrecurvum apice ad stylum abeuntis, stylo filiformi 3 mm. longo apice \pm dilatato brevissime 2-labiato. Cupula fruetifera subplana. Achænia natura drupacea oblique oblonga 4 mm. longa \pm complanata, stylis persistentibus. Pyrenæ oblique ovatae 2 mm. longæ apice obtusæ basi subrotundatae facie profunde rugulosæ.

HAB. In Monte Morrison, ad 12000 ped. alt., leg. U. MORI et S. KATO.

Near *R. calycinus* WALL.; but differs from it in having much smaller leaves and lacerate stipules.

Rubus cochinchinensis TRATT.; FOCKE Species Ruborum in Bib. Bot. XVII. Heft. 72. p. 49.

HAB. Hainan, leg. Z. KATSUMADA, 1910.

DISTRIB. An endemic plant.

Rubus floribundo-paniculatus HAYATA sp. nov. Rami recti, pubescentes, aculeis descendente-recurvis $1\frac{1}{2}$ mm. longis. Folia alterna ovata 9 cm. longa $4\frac{1}{2}$ cm. lata apice acuta ad apicem breve cuspidata basi obtusa margine serrata deorsum prope basin integra, (costis supra impressis hirsutis, venis lateralibus utroque latere 5–6 supra hirsutis tenuibus recurvis, venulis supra non conspicuis, costis venis subtus elevatis conspicuis hirsutis, venulis subtus conspicuis distinctis transversis reticulatis), subtus pallidiora, petiolis brevissimis $\frac{1}{2}$ cm. longis hirsutis, stipulis linearibus 7–8 mm. longis longe laciniatis, laciniis filiformibus. Flores paniculati, paniculis terminalibus floribundis 16 cm. longis 14 cm. latis pyramidalibus, rhachidibus pedicellis calycibusque omnibus velutinosis, rhachidibus et ramis rhachidis minute aculeolatis, bracteis stipulis conformibus sed minoribus. Calyx patens subplanus extus veluti-

nosus, lobis ovatis 7 mm. longis apice acutis acuminatis ad apicem cuspidoformibus 4 mm. latis intus basi glabris. Petala 5 obovato-spathulata 3 mm. longa $1\frac{1}{3}$ mm. lata apice retusa vel obtusa, sursum irregulariter denticulata vel subintegra deorsum integra. Stamina 8, filamentis glabris 6 mm. longis, antheris suborbicularibus utrinque emarginatis, connectivis glabris. Receptaculum carpellorum dense pilosum, pilis rectis. Carpella 8, 7 mm. longa. Ovarium deorsum dense pilosum sursum glabrum, stylo filiformi glabro.

HAB. Shintikuchō: Taiheishō, leg. Y. SHIMADA, Sept. 1907.

Rubus kotœnsis HAYATA sp. nov. Rami glabri sublaeves rubescentes inermes. Folia pinnata generaliter 5-foliolata rarius 7-foliolata ovata in ambitu, cum petiolo 15 cm. longa 9 cm. lata, pinna terminali magna ovata 6 cm. longa 3 cm. lata apice acuminata basi truncato-cordata vel rotundata chartacea margine duplicato-serrulata utraque pagine glabra (supra costis venis impressis pilis minutis parce vestitis, subtus prominentibus nudis rubro-coloratis) subtus glauca, (venis lateralibus utroque latere costæ 12 subrectis apicem serrarum attingentibus), petiolulo $1\frac{1}{2}$ –2 cm. longo, pinnis lateralibus oppositis cum eo terminali conformibus sed minoribus, petiolulis brevissimis 3 mm. longis supra suleatis puberulis, petiolis eire. 3 cm. longis cum rhachidibus glabris supra profunde suleatis basi \pm dilatatis, jugis pinnarum a se eire. 2 cm. remotis, stipulis linearibus cum petiolo adnatis apice liberis, partibus liberibus linearibus 1 cm. longis 1 mm. latis ab axilla foliorum 2 mm. remotis. Cymæ terminales vel ad apicem ramorum lateralium terminales paucifloratae glabrae 3–4 cm. longæ 3–5-floratae, bracteis linearibus glabris. Calycis lobi ovati 9–10 mm. longi 5–6 mm. lati apice cuspidiati basi \pm contracti, extus glabri versus marginem velutinosi, intus basi glabri sursum velutinosi. Petala 5 orbiculato-ovata 11 mm. longa 8 mm. lata apice rotundata, basi late cuneato-contracta, ad insertionem 1 mm. lata. Stamina 8, filamentis complanatis 4 mm. longis $\frac{1}{3}$ mm. latis apice contractis filiformibus, antheris oblongis utrinque emarginatis glabris. Receptaculum carpellorum toriforme cylindraceum 3 mm. longum glabrum, carpellis glabris. Syncarpium ellipsoideum 11 mm. longum 9 mm. latum. Achænia semivoidea subcomplanata $1\frac{1}{2}$ mm. longa glabra reticulato-rugosa.

HAB. Kōtōshō, leg. K. MIYAKE, 1889; S. SASAKI 1913.

Near *R. fraxinifolius* Poir., but differs from it by the unarmed branches and petioles, and much smaller flowers.

Rubus laciniato-stipulatus HAYATA sp. nov. *Rubus moluccanus* HAYATA Ic. Pl. Formos. I. p. 228, (non LINN.). Rami dense piloso-villosi aculeolati, aculeis 2-3 mm. longis \pm descendento-patentibus \pm recurvatis basi longitudinaliter dilatatis. Folia in ambitu cordato-orbicularia 10-5 cm. longa totiusque lata 5-lobata (lobis brevioribus) margine duplicato-denticulata vel grosse dentata (dentibus denticulatis) apice obtusa basi late cordata, supra fuscentia rugosissima, (venulis impressis reticulatis, areolis reticulorum elevatis ad centrum areolarum pilo recto uno instructis) supra pilosa, (pilis adpressis), subtus tomentoso-villosa albicantia, (venis venulisque subtus elevatis reticulatis, areolis reticulorum subtus impressis), 5-nervata, nervis rectis supra inermis subtus basi \pm aculeolatis, petiolis dimidium laminæ folii aequantibus villosis aculeolatis, stipulis 9-10 mm. longis profunde laciniatis, laciniis 7-6 mm. longis linearifiliformibus, extus tomentosis intus glabris. Racemis brevissimi petiolo breviores vel æquilongi axillares paniciflorati, floribus 2-3 rariis solitariis, pedicellis cire. 1 em. longis bracteis 2-3 instructis, stipulis conformibus sed minus laciniatis valde angustioribus. Calyx patens subplanus extus basi dense pilosus 5-lobatus, lobis ovatis 7 mm. longis apice euspidato-acuminatis 5 mm. latis integris vel pani-serratis extus medio dense pilosis versus marginem villosis, intus breve villosis. Petala 5 ovata 8½ mm. longa 6½ mm. lata apice obtusa ad centrum \pm retusa basi late cuneato-contracta ad unguiculum cire. 1 mm. longum abeuntia margine obscure crenulata utrinque glabra. Stamina ∞ , 2-3 seriatim disposita 4½ mm. longa, filamentis glabris 4 mm. longis ½ mm. latis subcomplanatis, antheris orbicularibus connectivis longe barbatis. Receptaculum carpellorum convexum glabrum vel panicissime pilosum. Carpella 1 em. longa, stylis filiformibus. Achaenia semi-cordata 2 mm. longa, exocarpiis tenuibus exsiccatis, pyrenis dorso profunde transverse rugosis facie irregulariter rugosis.

HAB. Sōkeiton, leg. G. NAKAHARA.

Near *R. alceaefolius* Poir. and *R. gilvus* FOCKE; but differs from them in having very slenderly lacinate stipules.

Rubus leucanthus HANCE in WALP. Ann. II. p. 468; FOCKE Sp. Rub. in Bib. Bot. XVII. Heft.-72, p. 148.

HAB. Haiman, leg. Z. KATSUMADA, 1910.

DISTRIB. South China.

Rubus dolichocephalus HAYATA sp. nov. Rami glanduloso-pilosæ, pilis patentibus 2 mm. longis globuliferis, aculeis descendento-recurvis latere compressis 3 mm. longis basi triangulare-dilatis. Folia in ambitu triangularia 9 cm. longa 11 cm. lata 3-foliolata (vel superiore simplicia), (foliolo terminali oblongo apice acuminato basi leviter cordato 7 mm. longo 3½ mm. lato duplicate-serrulato, petiolulo terminali 2½ cm. longo, foliolis lateralibus oblongis terminali brevioribus basi obtusis ± obliquis, petiolulis 0 vel 2 mm. longis), chartacea viridia supra adpresso hirsuta subtus velutinosa, (costis et venis lateralibus supra planis tenuiter hirsutis, subtus tenuiter elevatis rubro-coloratis, costis aculeolatis, venis lateralibus parallelis subrectis utroque latere costæ 10-12), petiolis 5 cm. longis foliolo lateralí aequilongis glanduloso-hirsutis aculeolatis, stipulis minutis linearibus elobatis basi cum petiolo adnatis apice liberis, partibus liberis 6 mm. longis linearibus hirsutis. Cymæ terminales paucifloratæ longe pedicellatae glanduloso-pilosæ aculeolatae. Calyx extus glanduloso-pilosus, lobis circ. 1 cm. longis oblongis apice longe cuspidatis, (cuspidibus setiformibus validis 3 mm. longis), basi 4½ mm. latis medio glanduloso-pilosus, prope marginem dense velutinosis, intus basi glabris sursum velutinosis. Petala 5, oblique orbicularia 8 mm. in diametro extus dense hirsuta intus glabra apice rotundata ad centrum mucronata basi contracta 1 mm. lata. Stamina 8, filamentis filiformibus glabris, antheris oblongis 1½ mm. longis, connectivis glabris. Receptaculum carpellorum toriforme cylindricum 5 mm. longum pilosum; carpella 8 circ. 2 mm. longa; ovarium semi-ovoideum ¾ mm. longum facie latereque glabrum dorso sursum pilis glandulosis obtectum, stylo filiformi 1½ mm. longo apice subtruncato. Syncarpium ovoideum 13 mm. longum 10 mm. latum, calyce valde desuper reflexo. Achænia semi-ovoidea ± recurva 1½ mm. longa subcomplanata facie glabra dorso minute setulosa stipitata, stipitibus complanatis 1 mm. longis ½ mm. latis.

HAB. Arisan: Karapin, leg. B. HAYATA et S. SASAKI, Jan. 10, 1912.

Near. *R. rosæfolius*, but differs from it in having ellipsoid syncarps and glandular hairy branch.

Rubus rosæfolius SMITH subsp. **Maximowiczii** FOCKE Sp. Rub. in Bib. Bot. XVII. Heft.-72, p. 155.

HAB. Funkiko, leg. B. HAYATA et S. SASAKI, Jan. 19, 1912.

DISTRIB. Southern parts of Japan.

Rubus rugosissimus HAYATA sp. nov. Caulis gracilis scandens teres tenuiter tomentosus minute et remote aculeolatus, (aculeis minutis 1-2 mm. longis), sursum dense molle tomentosus. Folia alterna chartacea vel tenuiter coriacea longe petiolata ovato-triangularia vel ovato-cordata in ambitu, 6½ cm. longa 5½ cm. lata 5-lobata margine duplicato-dentata, (lobo terminali 3 cm. longo 3 cm. lato apice acuto vel obtuso, lobis lateralibus brevioribus), basi leviter cordata vel late truncata supra fuscantia subglabra vel parce hirsuta rugosissima, (venulis supra impressis, areolis reticulorum elevatis), tuberculato-rugosa, subtrus dense molle fulvo-flavo-tomentosa (nervis venis venulisque elevatis areolis reticulorum subtrus impressis), 5-nervata, nervis rectis divaricatis apicem leborum attingentibus, petiolis 3½ cm. longis lamina leviter brevioribus basi non inerasatis dense villosis, stipulis late obovatis 7 mm. longis basi 3 mm. latis apice rotundatis laceratis extus villosis intus glabris. Flores ad axillæ clustati vel breve racemosi, racemis axillaribus vel ad apicem ramorum lateralium terminalibus folio brevioribus, rachidibus flexuosis dense villosis, bracteis basi pedicellorum sitis stipulis conformibus, pedicellis 4 mm. longis villosis bracteolis 2 instructis, bracteolis alternis 3 mm. longis ovatis obtusis apice paucæ lacerato-dentatis extus villosis. Calycis tubus eupuliformis extus villosus, limbus 5-lobatus, lobis ovato-euspidatis 7 mm. longis basi 5 mm. latis apice euspidatis paucæ dentatis vel integris extus villosis intus brevissime villoso-pubescentibus. Petala late rhomboideo-orbiculata 5 mm. longa 5½ mm. lata apice rotundata ad centrum retusa basi late cuneata, basi contracta basi ½ mm. lata, nervis non conspicuis. Stamina ∞ , 2-3 seriatim disposita, filamentis glabris 3½ mm. longis subeoplanatis, antheris suborbicularibus, connectivis longe barbatis. Receptaculum carpellorum pilosum

conicum $1\frac{1}{2}$ mm. longum. Carpella 6 mm. longa; ovarium $\frac{3}{5}$ mm. longum semi-ovoideum glabrum apice ad stylum abeuns, stylo filiformi apice 2-labiato. Achænia matura oblique ovoidea 2 mm. longa $1\frac{2}{3}$ mm. lata, exocarpiis tenuibus. Pyrenæ \pm achænio minores profunde subechinato-rugulosæ.

HAB. Hakkitsu, leg. S. SASAKI et B. HAYATA Juli. 1913.

Near *R. Elmeri* FOCKE.

Rubus Shimadai HAYATA sp. nov. Rami teretes fuscantes minute aculeolati, (aculeolis 1 mm. longis), flexuosi tenuiter et breviter pubescentes vel glabri. Folia alterna cordata vel reniforme cordata $4\frac{1}{2}$ cm. longa 6 cm. lata apice rotundata basi cordata obseure tenuiter 5-lobata margine denticulata, supra glabra vel ad venas impressas \pm pubescentia, subitus ad venas elevatas tomentellata, 5-nervata, venuis transverse reticulatis impressis, subitus nervis venis venulisque prominente elevatis reticulatis, petiolis lamina vix brevioribus hirsutis, stipulis minutis 3 mm. longis laciniatis. Racemi breviores circ. 1 em. longi axillares, pedicellis 3 mm. longis bractea una instructis, bracteis stipulis conformibus, omnibus tomentosis. Calyx subplanus, lobis 5 ovatis $5\frac{1}{2}$ mm. longis basi 4 mm. latis apice acutis integris vel apice 2-3-dentatis extus piloso-villosis intus villosus; cupula plana intus glabra sed ad centrum pilosa. Stamina ∞ 2-seriatim disposita 3 mm. longa, filamentis filiformibus, antheris orbicularibus, connectivis glabris. Petala 5, rhomboideo-ovata apice rotundata basi late cuneata ad unguem brevissimum contracta integra apice sursum \pm denticulata glabra. Achænium maturum semi-cordatum $2\frac{1}{2}$ mm. longum.

HAB. Kelungelhō: Taiheishō, leg. Y. SHIMADA, 1908, Dec.

Rubus sphærocephalus HAYATA sp. nov. Rami dense glandulosohirsuti, (pilis transverse patentibus) aculeolati, aculeolis transverse patentibus sursum descendento-recurvatis latere compressis triangulari-cuspidatis maximis 5 mm. longis basi 4 mm. latis. Folia pinnata, in ambitu oblongo-triangularia, pinnis 7-5-3, pinna terminali maxima, jugo pinnarum juxta terminalem pinnam minima, jugis inferioribus majoribus, pinnis lateralibus oppositis, pinna terminali ovata 5 cm. longa $2\frac{1}{2}$ -3 cm. lata herbacea utraque pagine parce hirsuta

apice acuminata basi obtusa margine duplicato-serrulata prope basin subintegra, costis et venis planis subtus tenuiter elevatis, venis lateralibus subrectis utroque latere costae 9-10, petiolulo 2 mm. longo, pinnis lateralibus ea terminali conformibus sed \pm minoribus subsessilibus, petiolis communibus 4 cm. longis cum rhachidibus parce glanduloso-hirsutis aculeolatis, aculeolis descendento-recurvatis, jugis a se 3 cm. remotis, stipulis linearibus cum petiolis adnatis apice liberis, partibus liberis 5 mm. longis a basi axillarum 3 mm. remotis. Flores laxe cymosi, cymis terminalibus pauci-floratis, floribus 2-3, pedicellis longis. Calycis lobi extus glanduloso-hirsuti, (pilis globuliferis rubris) trianguli-ovati apice longe euspidati (caspidibus exceptis) 8 mm. longi 6 mm. lati apice euspidibus longissimis 6 mm. longis instructi intus basi glabri sursum velutinosi. Petala late orbicularia 13 mm. longa 16 mm. lata apice rotundata basi contracta, ad insertionem 1 mm. lata, margine integra, extus hirsuta, intus glabra. Stamina ∞ , filamentis glabris, antheris ellipticis $1\frac{1}{3}$ mm. longis, connectivis glabris. Receptaculum carpellorum subglobosum $4\frac{1}{2}$ mm. longum, glabrum stipitatum, stipitibus latis 1 mm. longis basi 2 mm. latis hirsutis. Carpellum $2\frac{1}{2}$ mm. longum; ovarium semi-ovoideum complanatum facie glabrum dorso glanduloso-setulosum stipitatum, stipitibus brevibus pilosis, stylo filiformi 2 mm. longo apice breve 2-labiato. Syncarpium depresso-globosum 14 mm. latum 11 mm. longum. Achænum semi-ovoideum $1\frac{1}{2}$ mm. longum, stipitatum, (stipite circ. 1 mm. longo $\frac{1}{3}$ mm. lato pilosiusculo), subcompressum latere facie glabrum reticulato-rugosum, dorso apice minute glanduloso-setulosum.

HAB. Arisan, leg. B. HAYATA et S. SASAKI, Jan. 1912.

Near *P. dolichocephalus* HAYATA; but differs from it by the depressingly globose syncarps.

Potentilla LINN.

Potentilla Morii HAYATA sp. nov. Herba perennis. Rhizomata sub-erecta 6-7 mm. longa basi ramosa, (ramis ad radices validiusculas aereantibus), apice folia radicalia et caules floriferos 2-3 emittentia. Folia radicalia cum petiolis 3-4 cm. longa vel longiora, 3-foliolata dense molle pilosa, foliolo terminali obovato $1\frac{1}{2}$ cm. longo 11 mm. lato utraque pagine molle piloso herbaceo utroque

latere margine dentibus 6 instrueto, (dentibus ascendentibus triangularibus $1\frac{1}{2}$ mm. longis), apice in ambitu rotundato basi cuneato-obtuso prope basin integro, (supra costis venisque impressis, venis lateralibus utroque latere costæ 6 subrectis ad apicem dentum attingentibus subtus tenuiter elevatis), petiolulo brevissimo 1 mm. longo, foliolis lateralibus \pm minoribus basi valde obliquis, petiolis 2 cm. longis vel longioribus longe molleque villosis, stipulis lanceolatis 7 mm. longis 2 mm. latis apice acuminatis extus pilosis intus glabris basi petiolo adnatis sursum liberis. Folia caulinæ iis radicalibus conformia sed minora, superiore sessilia. Caulis subrectus 5–10 cm. longus interdum 20–30 cm. longus tunc procumbens toloniformis. Flores ad apicem caulinæ solitarii vel axillares, pedicellis rectis 1–2–3 cm. longis pilosis. Calyx extus dense pilosus, lobis 2-seriatim dispositis, exterioribus spathulatis 4 mm. longis $1\frac{1}{3}$ mm. latis apice obtusis basi \pm contractis, lobis interioribus majoribus elongato-triangularibus $4\frac{1}{2}$ mm. longis apice acuminatis extus hirsutis basi latissimis $2\frac{1}{2}$ mm. latis intus basi glabris sursum pubescentibus. Petala 5 flava orbiculato-obcordata 8 mm. longa totiusque lata apice emarginata basi late cuneato-contracta ad insertionem $\frac{1}{3}$ mm. lata 5-nervata. Stamina circ. 20, $3\frac{1}{2}$ mm. longa, filamentis glabris $2\frac{1}{2}$ mm. longis, antheris 1 mm. longis oblongo-linearibus. Receptaculum carpellorum dense albo-pilosum ellipsoideum. Carpellum oblique obovatum, stylo laterali 1 mm. longo columnari apice punctiformi. Syncarpium depresso-globosum. Achænum oblique ovoidem a latere compressum 1 mm. longum facie lœve dorso apice \pm rugulosum.

HAB. Tonkwankei, Bataiankei, leg. U. Mori, Aprili. 1910.

Near *P. Matsumuræ* WALB., but differs from it by the much shorter styles and more numerous carpels.

Potentilla morrisonensis HAYATA sp. nov. Rhizomata ascendento-repentia, stipulis foliorum deciduorum persistentibus imbricatis complete obtecta, (stipulis imbricatis tenuibus castaneis cum petiolo connatis, apice liberis 1 cm. longis 4 mm. latis), apice folia radicalia 3–5 et caulem singulum emittentia. Folia radicalia digitatim 3-foliolata, foliolo terminali obovato-cuneato-obtriangulari 14 mm. longo 11 mm. lato apice in ambitu rotundato-truncato

basi cuneato medio sursum margine inciso-dentato, (dentibus utroque latere 7 vel 5 oblongis 3-4 mm. longis $2\frac{1}{2}$ mm. latis apice obtusis basi non contractis), herbaceo supra minus hirsuto subtus plus hirsuto margine ciliato subsessili vel brevissime petiolulato, foliolis lateralibus eo terminali æquifolius valde obliquis plus incisis, petiolis 4-5 cm. longis longe hirsutis gracilibus, stipulis magnis lanceolatis circ. 1 cm. longis $2\frac{1}{2}$ mm. latis extus hirsutis intus glabris tenuibus castaneis petiolo fere connatis apice liberis, partibus liberis subtriangularibus 3 mm. longis, stipulis complete caerulei amplectantibus. Caulis hirsutus 10-12 cm. longus erectus gracilis simplex vel paucem ramosus, foliis caulinis minoribus breve petiolatis vel subsessilibus. Calyx extus hirsutus intus glaber, lobis exterioribus lanceolatis $4\frac{1}{2}$ mm. longis minus 2 mm. latis apice acutis basi contractis ad insertionem $\frac{1}{2}$ mm. latis, lobis interioribus latioribus oblongis 5 mm. longis 2 mm. latis basi \pm dilatatis apice obtuso-acutis. Petala 5 obcordata 9 mm. longa totiusque lata flava apice obcordato-emarginata basi late cuneata ad insertionem $\frac{1}{2}$ mm. lata. Stamina 20, filamentis glabris filiformibus 4 mm. longis, antheris cordatis minus 1 mm. longis apice emarginatis. Receptaculum toriforme pilosum. Achænum ovoideum latere subcompressum $1\frac{1}{2}$ mm. longum, stylo infra apicem ovarii latere sito filiformi 3 mm. longo.

=*P. gelida* HAYATA Ic. Pl. Formos. I. p. 237.

HAB. Mt. Morrison., ad 13094 ped. alt., 1905, Nov.

Near *P. Matsumuræ* WALB., but differs from it by the much longer style and fewer achenes.

Rosa LINN.

Rosa transmorrisonensis HAYATA sp. nov. Rami glabri minute longitudinaliter rugulosi teretes remote aculeolati, aculeolis 4 mm. longis rectis transverse patentibus, cicatricibus aculeolorum oblongis, ramulis lateralibus numerosis 2-3 cm. longis non ramosis flore singulo terminatis. Rami floriferi laterales basi foliis 5-6 suffulti, foliis infimis minimis, superioribus majoribus, foliis infimis 8 mm. longis 7-foliolatis, foliolis parvis 3 mm. longis, stipulis cum petiolo connatis 3-4 mm. longis lanceolatis serrulatis, foliis superioribus majoribus $2\frac{1}{2}$ cm. longis in ambitu obovatis 7-foliolatis, foliolo

terminali obovato vel ovato-oblongo 11 mm. longo $7\frac{1}{2}$ mm. lato utrinque obtuso margine serrato, (serris ascendentibus subrectis acutis latere superioribus $\frac{1}{2}$ mm. longis latere inferioribus $1\frac{1}{2}$ mm. longis apice acutis \pm callosis), supra costa impressa, venis venulisque impressis reticulatis, subtus costa prominente elevata aculeolis truncatis minutis 2-3 instructa, petiolulo 3-4 mm. longo, foliolis lateralibus eo terminali conformibus subsessilibus minoribus, foliolis infimis minimis 6 mm. longis $3\frac{1}{2}$ mm. latis, foliolis oppositis, jugis 4 mm. a se remotis, petiolis communibus 1 cm. longis cum rhachidibus supra profunde sulcatis subalatis setalis glandulosis truncatis remote instructis, ad nodos jugorum \pm hirsutis, subtus aculeolis acutis remote instructis, stipulis linearibus fere perfecte cum petiolo connatis 5 mm. longis margine fimbriatis, partibus liberis linearibus 2 mm. longis recurvis. Flores ad apicem ramorum lateralium solitarii terminales, pedunculis $1\frac{1}{2}$ cm. longis setulis glandulosis paucissime instructis caeterum glabris. Calycis tubus ureolato-ovoideus $3\frac{1}{2}$ mm. longus $2\frac{1}{3}$ mm. latus, lobis cuspidato-ovatis extus prope marginem setulis glandulosis instructis paucce hirsutis intus dense velutinosus 9 mm. longis (excepte euspides) 3 mm. latis apice cuspidatis vel tricuspidatis, (cuspidibus linearibus 3 mm. longis $\frac{2}{3}$ mm. latis), basi utroque latere cuspidibus singulis instructis, interdum utraque pagine velutinosus. Petala 5 obcordata apice cordato-emarginata vel breve 2-lobata basi late cuneata ad basin truncata, partibus truncatis 3 mm. latis ad basin contractis ad insertionem 1 mm. latis. Stamina ∞ fance tubi calycis affixa ∞ -seriata, filamentis circ. 4 mm. longis suberispatis filiformibus glabris, antheris late reniformibus 1 mm. latis, latioribus quam longioribus basi 2-lobatis apice emarginatis. Discus ultra calycis tubum productus annulari-conicus, partibus productis $\frac{1}{2}$ mm. longis. Styli 9-10. Carpella 9-10, in tubo calycis inclusa longe et dense albo-setuloso-pilosa, cavo calycis dense piloso-setuloso, setulis albis erectis rectis 2 mm. longis. Ovarium fusiforme 1 mm. longum, stylo filiformi longe exerto 5 mm. longo apice incrassato, stigmate botrioideo-pectinato.

HAB. Mt. Morrison, leg. U. MORI.

Near *R. Willmottiae* HEMSL. (Bot. Mag. t. 8186), but differs from it by the much smaller leaflets with acuter serration and much smaller alternate (not opposite) spines.

Rosa microcarpa LINDL.; FORBES et HEMSL. Ind. Fl. Sin. I. p. 251.

HAB. Töyencho: leg. S. SASAKI, Sept. 1908.

DISTRIB. China.

Sanguisorba LINN.

Sanguisorba formosana HAYATA sp. nov. = *Poterium formosana* HAYATA (Tab. XVII.). Herba 80–100 cm. alta glabra. Folia radicalia pinnata in ambitu oblongo-ovata cum petiolis 13 cm. longa 5 cm. lata, pinnis 15–17, superioribus majoribus infimis minoribus, pinna terminali longissima lineari 3–3½ em. longa 5–6 mm. lata glabra apice obtuso-acuta vel obtusa basi acuta margine regulariter serrulata, (serrulis subtriangularibus apice ascendente-recurvis) chartacea, costa supra impressa subtus elevata, venis lateralibus supra subimpressis subtus elevatis, pinnis lateralibus terminali conformibus sed minoribus a se 1–2 cm. remotis basi truncatis obliquis, infimis minimis breve petiolulatis, petiolulis 1–2 mm. longis cum rhachidibus profunde sulcatis gracilibus, petiolis communibus 2–3 em. longis basi dilatatis. Folia caulinata iis radicalis conformia remote sita superioribus minoribus interdum 3-foliolatis. Caulis gracilis elongatus glaber sulcatus remote ramosus, ramis elongatis gracilibus suberectis subrectis. Flores dense capitulato-spicati, spicis elongato-pedunculatis, pedunculis in longitudine variabilibus 3–14 cm. longis gracilibus, bracteis minutis 2–3 instructis. Spicæ (vel capitula) cylindraceæ erectæ rectæ vel ± recurvatae 1–2–3 cm. longæ 6–7 mm. latæ, rhachidibus (vel toris capitulorum) hirsutis, bracteolis 3 basi floris singuli dispositis minutis linearibus filiformibus vel spathulatis 2 mm. longis hirsuto-ciliolatis, floribus sessilibus. Calycis tubus obconicus 1½ mm. longus 1 mm. latus 4–alatus lobis 4, 2–exterioribus minoribus 2½ mm. longis 1½ mm. latis oblongis, 2–interioribus latioribus obovatis intus glabris extus hirsutis basi et apice subinermis ad marginem tenuibus hyalinis. Petala 0. Stamina 4, filamentis 2½ mm. longis glabris, antheris didymis ½ mm. longis. Styli minuti 1 mm. longi, stigmatibus dilatatis peltatis.

HAB. Töyenchö: Daikyūen, leg. S. SASAKI, Nov. 1910.

Near *S. officinale* L., but differs from it in having narrower leaves and very much smaller linear bracts.

***Cotoneaster* MEDIK.**

Cotoneaster Konishii HAYATA sp. nov. Rami subrecti, cortice fusco-cinerascenti, glabri laeves non vel paucem lenticellati, ramiculis lateralibus numerosis brevioribus 5 cm. longis cicatricibus foliorum transverse semi-annuliformibus dense notatis, apice folios et flores gerentibus. Folia chartacea rhomboideo-ovata obovata vel ovata 23 mm. longa 15 mm. lata apice acuta basi cuneato-obtusa vel obtusa utraque pagina hirsuta, costis supra impressis, venis lateralibus 4-5 impressis subtus costis et venis elevatis, petiolis 2-3 mm. longis supra sulcatis, stipulis linearibus vel lanceolatis 2-3 mm. longis. Flores cymosi, cymis terminalibus panei-floratis hirsutis, bracteis lanceolatis vel linearibus hirsutis. Calyx campanulatus extus hirsutus intus glaber 4 mm. longus 5 mm. latus apice 5-lobatus, lobis triangularibus 1½ mm. longis totiusque latis margine barbatis intus glabris. Petala 5, cuneato-ovata 4 mm. longa 2½ mm. lata apice rotundata basi cuneata ad insertionem ½ mm. lata marginie sursum erosa prope basin integra. Stamina 10, filamentis glabris 2½ mm. longis deorsum dilatatis basi ⅓ mm. latis apice angustissimis, antheris oblongis ¼ mm. longis. Carpella 5-3, ventrali libera, dorso cum calyce adnata, apice libera, dense molleque barbis obtecta, stylis rectis 2 mm. longis apice truncatis.

HAB. Bataiankei, ad 9710 ped. alt., leg. N. KONISHI, 1902.

Near *C. integrifolia* and *acutifolia*, but differs from them by the much smaller leaves.

***Photinia* LINDL.**

Photinia buisanensis HAYATA sp. nov. Rami validi cinerascentes verrucosi rugosi lenticellis notati, cicatricibus foliorum late obtriangularibus. Folia oblongo-lanceolata ob lanceolata, lamina coriacea 11 cm. longa 3 cm. lata apice acuta acuminata basi cuneato-attenuata margine supra basin sursum remote serrata, (serris 8 mm. a se remotis ascendento-recurvis), marginem ± recurva prope basin integra utraque glabra, (costis supra leviter elevatis, subtus prominente elevatis, venis lateralibus primariis supra valde subtus tenuiter elevatis, venis secundariis supra elevatis conspicuus subtus

tenuissimis vel non conspicuis, venis lateralibus utroque latere costæ 12-13 subrectis vel \pm recurvis prope sinus serrarum furcato-ramosis, subtus pallidiora, petiolis 3 em. longis tenuiter aлатis basi \pm incrassatis. Flores racemosi vel racemoso-paniculati 4-5 em. longi 4 em. lati dense florati, rhachidibus et pedicellis dense ferrugineo-pilosus, bracteis oblique ovatis 4 mm. longis intus glabris extus dense pilosis. Calyx campanulatus, tubo campanulato 4 mm. longo fauce 4 mm. lato intus glabro extus dense piloso, limbo 5-lobato, lobis oblongo-triangularibus 3 mm. longis basi 2 mm. latis apice obtusis intus glabris. Petala 5 obovata 8 mm. longa 5 mm. lata apice breve 2-lobata (lobis 1 mm. longis apice obtusis), basi cuneata subunguiculata alba extus glabra intus parce longe et tenuiter barbata. Stamina circ. 30, ad fauem tubi calycis affixa 3-4 mm. longa erecta, filamentis glabris 3½ mm. longis basi \pm dilatis apice filiformibus, antheris oblongo-ovatis 1-1½ mm. longis. Ovarium basi calycis tubi adnatum 1½ mm. longum 3-loculare, loculis 2-ovulatis, stylis basi ad medium dense barbatis sursum glabris medio sursum 3-fidis, ramis erectis.

HAB. Buisan, leg. S. SASAKI, Mart. 1910.

Near *R. deflexa* HEMSL., but differs from it by the much smaller leaves and flowers.

Osteomeles LINDL.

Osteomeles anthyllidifolia LINDL.; FORBES et HEMSL. Ind. Fl. Sin. I. p. 265.

HAB. Kōtōshō, leg. S. SASAKI, Juni. 1913.

DISTRIB. Japan, Bonin, Sandwich, Maingaia and Pitcairn Islands (HEMSLEY.)

Saxifrageæ.

Mitella LINN.

Mitella japonica MIQ. var. ***formosana*** HAYATA n. v. Rhizoma ascendento-repens, radices numerosas emittens, squamis obtectum. Folia omnia radicalia 5-10 ad apicem rhizomatis, longe petiolata, lamina ovato-cordata 6 em. longa 4 em. lata apice trianguli-acuta basi profunde cordata

herbacea margine inciso-serrata obscure 5–7 lobata, (lobis triangulari-acutis, serris acutis), facie superiore setuloso-hirsuta (pilis 1–2 mm. longis) ad nervos venasque glabra, facie inferiore (venis et venuis exceptis) glabra ad nervos venas venuisque hirsuta 5–7-nervia, nervis rectis ad apicem lobi ad attingentibus, nervis supra planis subtus elevatis, venuis reticulatis, petiolis 4–5 cm. longis lamina aequilongis $1\frac{1}{2}$ mm. latis dense barbatis, barbis transverse patentibus $1\frac{1}{2}$ mm. longis, stipulis intra-axillaribus singularibus subrotundatis glabris margine ciliolatis scariosis subrubescens 8 mm. in diametro. Scapi aphylli 20–30 cm. longi a medio sursum florigeri patentio-hirsuti basi bracteis 2 suffulti, bracteis stipulo conformibus. Flores subsecundatim spicati, rhachidibus dense breveque glanduloso-hirsutis, (pilis transverse patentibus), floribus a se 5 mm. remotis, bracteis singulis basi pedicellorum dispositis, bracteis quadrangularibus 1 mm. latis apice divaricatim 3-euspidatis, pedicellis 1–2 mm. longis gradatim ad calycem abeuntibus. Calyx late campanulatus 2 mm. longus 3 mm. latus, limbo 5-lobato, lobis acuto-triangularibus 1 mm. longis totiusque latis extus dense breveque glanduloso-pubescentibus. Petala 5, divaricato-laciñata 3 mm. longa, laciñis 5 lateralibus oppositis, a terminali angulo 90° divaricatis, terminali 2 mm. longa, lateralibus 1 mm. longis, omnibus filiformibus, lamiis (partibus principalibus) linearibus $1\frac{1}{2}$ mm. longis $\frac{1}{3}$ mm. latis glabris. Stamina 5, petalis opposita calycis limbo affixa 1 mm. longa, filamentis subcomplanatis linearibus circ. 1 mm. longis glabris, antheris cordato-reniformibus apice triangulari-acutis basi reniforme cordatis $\frac{1}{4}$ mm. latis latioribus quam longioribus. Ovarium inferius apice subplanum \pm elevatum ad stylum abeuns, stylis 2 columnaribus $\frac{2}{3}$ mm. longis apice 2-furcatis, ramis $\frac{1}{3}$ mm. longis apice stigmatosis. Capsulae 2-valvatae, valvis membranaceis. Semina ellipsoideo-fusiformia circ. 1 mm. longa $\frac{5}{14}$ mm. lata latere 1-costata facie longitudinaliter reticulata, testa fusco-rubra; albumen copiosum.

HAB. Arisan, leg. S. SASAKI et B. HAYATA, Jan. 1912. Mt. Morrison, 8000–12000 ped. alt.

Mitella japonica HAYATA in Fl. Mont. Formos. p. 88, (non MIQUEL).

Very near the type, but distinguishable from it in having rectangularly divaricated lacinias of the petals, longer stamens and smaller seeds which are not covered by the minute trabecules.

Chrysosplenium LINN.

Chrysosplenium formosanum HAYATA sp. nov. (Tab. XVIII.) Herba stolonifera; caulis 10–15 cm. longus. Folia radicalia longe petiolata, lamina cuneato-ovata $1\frac{1}{2}$ cm. longa 13 mm. lata, herbacea, apice rotundata, basi obtriangulari-cuneata, margine a medio sursum undulato-crenulata, utraque pagine tenuiter hirsuta, (pilis crispatis 1 mm. longis pagine inferiore brevioribus), margine crispato-ciliolata, (venis non conspicuis), basi subito ad petiolum abeuntia, petiolis 2 cm. longis laminam 2-plo superantibus sursum $1\frac{1}{2}$ mm. latis basi dilatatis 3 mm. latis tenuibus margine longe ciliolatis, ciliis 1– $1\frac{1}{2}$ mm. longis crispatis, utraque facie hirsutis, pilis crispatis. Caulis a basi ramosus \pm hirsutus (pilis brevioribus) foliis caulinis minoribus 4–5 instructus, foliis alternis 2 cm. a se remotis. Folia caulina minora orbicularia $\frac{1}{2}$ cm. in diametro, margine crenulata hirsuta, petiolis lamina longioribus. Flores quasieymosi, cymis paucis-laxifloratis basi foliis floralibus singulis suffultis, foliis floralibus iis caulinis conformibus sed minoribus sessilibus vel breve petiolatis. Sepala 4 late rotundata inæqualia, altra majora $1\frac{1}{2}$ mm. longa 2 mm. lata basi latissima apice rotundata, altra minora $1\frac{1}{3}$ mm. longa $1\frac{1}{2}$ mm. lata, omnia viridia extus glabra intus pilis brevissimis obtecta. Stamina 8, filamentis brevissimis $\frac{1}{4}$ mm. longis complanatis, antheris terminalibus cire. $\frac{1}{2}$ mm. latis $\frac{1}{4}$ mm. longis reniformibus rima terminali dehiscentibus. Ovarium semi-inferius complanatum brevissimum 1-loculare, stylis 2 minutis teretibus $\frac{1}{3}$ mm. longis $\frac{1}{2}$ mm. a se remotis erecto-rectis.

HAB. Montibus centralibus, leg. T. KAWAKAMI et U. MORI, Aprili. 1910.

Near *C. japonicum* Miq., but differs from it by the hairy leaves and 4-merous flowers.

Deutzia THUNB.

Deutzia kelungensis HAYATA (Fig. 16.) Ic. Pl. Formos. II. p. 8.

OBSERV. Rami graciles cinerascentes teretes ut videntur scandentes, ramulis gracilibus angularibus tenuiter stellato-pubescentibus, inter petioles transverse striatis. Folia opposita ovato-oblonga vel ovato-lanceolata 8 cm. longa 3 cm. lata apice acuminata, (acuminibus acutis vel obtusis), basi obtusa

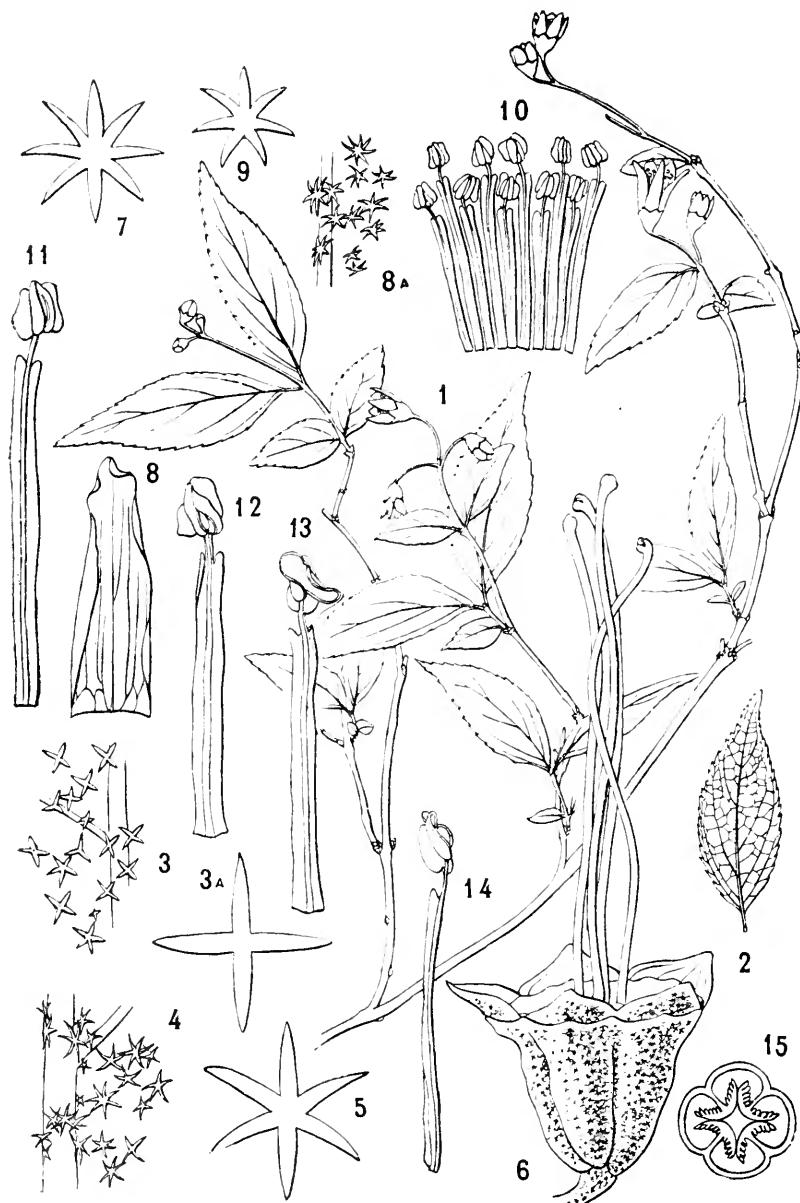


Fig. 16.

Deutzia kelungensis HAYATA. 1, a branch; 2, a leaf; 3, a portion of a leaf showing hairs on the upper side; 3A, one of the hairs, much more magnified; 4, the same portion, of a leaf, showing hairs on the under side; 5, one of the hairs; 6, a flower, petals and stamens taken off; 7, a hair on the calyx; Fig. 8, a petal; 8A, hairs on the same; 9, one of the hairs, much more magnified; 10, stamens; 11, 12, 13, 14, a stamen, seen from different sides; 15, cross section of an ovary. Fig. 1 and 2, $\times \frac{3}{2}$; others variously magnified.

rotundata vel acuta margine serrulata, (serrulis brevissimis breve apiculatis), supra seabra stellato-pubescentia, costis et venis tenuissimis subtus pallidissima pilis stellatis densiuscula vel parce obtecta costis et venis lateralibus prominentibus, petioli 6 mm. longis supra sulcatis. Paniculae ad apicem ramicorum terminales vel axillares 6 cm. longæ pauci-floratæ, pedicellis 2 mm. longis, bracteis minutis subulatis. Calyx campanulatus extus plus minus stellato-pubescentis 3 mm. longus, lobis patentibus triangularibus obtusis vel acutis $1\frac{1}{2}$ mm. longis 2 mm. latis caducissimis. Petala 5-6 dupli-cato-valvata erecta vel erecto-patentia oblonga $8\frac{1}{2}$ mm. longa 4 mm. lata apice subacuta basi late truncata margine plicata plus minus pubescentia vel subglabrata. Stamina 10-12, altra longiora, altra breviora, staminibus longioribus 7 mm. longis, filamentis dilatatis 6 mm. longis 1 mm. latis apice obtuse ob-sagittato-attenuatis. Discus annularis integer. Styli 4 distincti apice leviter 2-lobati stigmatosi. Capsulae subglobosæ $3\frac{1}{2}$ mm. longæ, 4-lobatae, septicide in coccus 4 deliscentes. Semina numerosa, fusiformia, late leviter compressa, utrinque alis $\frac{1}{2}$ mm. longis instructa, longitudinaliter striatis.

HAB. Kelung: Zuihō, leg. T. KAWAKAMI, Mart. 1907, (No. 4235).

Near *D. gracilis* and *D. parviflora*, but differs from the former in having much broader hairy calyx-lobes and more sebrous leaves, and from the latter in having nearly erect dupli-cately valvate petals and a few-flowered panicles or even racemes. The petals of *D. parviflora* appear to be deeply imbricate, but those of the present plant are apparently valvate.

***Pileostegia* HOOK. f. et THOMS.**

***Pileostegia urceolata* HAYATA sp. nov.** Ramuli, cortice longitudinaliter rugoso. Folia opposita, obovato-elliptica vel oblanceolata, $5\frac{1}{2}$ -6 cm. longa 2 cm. lata, apice obtusa brevissime cuspido-obtusa, basi cuneato-obtusa, margine integra, coriacea, utraque pagine glabra, (costis supra impressis subtus elevatis, venis primariis lateralibus supra non visis subtus tenuiter elevatis gracilibus utroque latere costæ 7-8 a costa angulo 70° egressis rectis prope marginem foreatis), subtus pallidissima, petioli 1 cm. longis supra sulcatis basi \pm dilatatis glabris. Paniculae terminales cum pedunculis 10 cm. longæ 9 cm. late, ramis oppositis, ramulis divaricatis, bracteis et bracteolis lanceolatis in

magnitudine variabilibus, pedicellis ultimis 2-3 mm. longis. Calycis tubus obconico-urceolatus vel obconicus 2 mm. longus 3 mm. latus, ultra ovarium inferius productus, partibus productis $\frac{1}{2}$ mm. longis, ore 5-dentatus, dentibus latissimis brevissimis $\frac{1}{3}$ mm. longis $1\frac{1}{2}$ mm. latis glabris. Petala 5, valvata, in calyptram connata; calyptra jam anthesin soluta $2\frac{1}{2}$ mm. in diametro $1\frac{1}{2}$ mm. longa; petalis singulis triangularibus 2 mm. longis $1\frac{2}{3}$ mm. latis extus glabris intus apice puberulis. Stamina 10 exserta 2-2 $\frac{1}{2}$ mm. longa, filamentis erispatis 2 mm. longis glabris, antheris cordatis $\frac{4}{5}$ mm. longis apice emarginatis paucissime hirsutis. Ovarium perfecte inferius obconicum apice planum, stylo breve columnati $1\frac{1}{2}$ mm. longo. Disens annularis 10-dentatus, dentibus obtusis.

HAB. Arisan, leg. K. UYEMATSU, 1913, (No. 37).

Near *Pileostegia viburnoides* and its variety *purpiflora*; but differs from them by the smaller leaves, smaller flowers with much shorter calyx-lobes, shorter stamens and somewhat urceolate calyx-tubes.

Pileostegia viburnoides HOOK. f. et THOMS.; MATSUM. et HAYATA, Enum. Pl. Formos. p. 132.

HAB. Taichū: Suiryūtō, (No. 1213); Sekikakusan; Chōsōkei, (No. 158); Kusshaku, leg. B. HAYATA et S. SASAKI, Juli. 1913.

Hydrangea LINN.

Hydrangea anomala DON.=*(H. glabra* HAYATA) in SCHNEIDER Illust. Handb. Lambh. II. p. 943, (fide SCHNEIDER).

As I have never seen a specimen of *H. anomala* DON., I am not in a position to decide whether the two (*H. anomala* and *H. glabra*) are exactly identical or not. I am here merely following SCHNEIDER's opinion.

Hydrangea glabrefolia HAYATA sp. nov. Rami recti teretes, cortice cinerascenti, ramulis rectis divaricatis rubro-purpurascensibus. Folia coriacea lanceolata, 5-5 $\frac{1}{2}$ cm. longa $1\frac{1}{2}$ -2 cm. lata, apice acuta, acuminata, basi cuneato-obtusa margine minute serrulata, (serrulis mucroniformibus $\frac{1}{2}$ mm. longis 3-4 mm. a se remotis), apice basique subintegra, (costis supra tenuiter impressis

subtus elevatis, venis supra planis subtus tenuiter elevatis), utraque page glabra, petiolis 6 mm. longis basi leviter dilatatis supra sulcatis. Cymæ terminales pseudo-umbellatae, radiis 3-4 exterioribus longioribus 1½ cm. longis, interioribus brevioribus 1 cm. longis pseudo-umbellulatis, umbellulis 10-12-floratis. Flores steriles marginales paucissimi interdum ad nullum reducti, pedicellis longioribus 1 cm. longis; sepala 4, obovato-orbicularia, 9 mm. longa 8 mm. lata, margine integra, 3-nervia, venis lateralibus 4-5 paucissimis non reticulatis. Flores fertiles parvi, pedicellis brevioribus 2-3 mm. longis; calycis tubus 1 mm. longus obconico-campanulatus 1½ mm. latus, limbo 5-dentato, dentibus remotis oblongo-triangularibus ½ mm. longis ¼ mm. latis; petala 5, oblonga, 2 mm. longa, 1 mm. lata, apice obtuse breve cuspidata basi obtuse breveque cuneata, ad insertionem ¼ mm. lata; stamina circ. 10, 1½ mm. longa, filamentis glabris crassiusculis teretibus 1 mm. longis, antheris oblongis utrinque emarginatis ⅓ mm. longis. Carpella 3, styli 3 circ. 1 mm. longi crassiusculi.

HAB. Tandaisan, leg. U. Mori, Aprili. 1910.

Near *H. chinensis*, but differs from it by the quite glabrous leaves, narrower lobes of the calyx, and many other points.

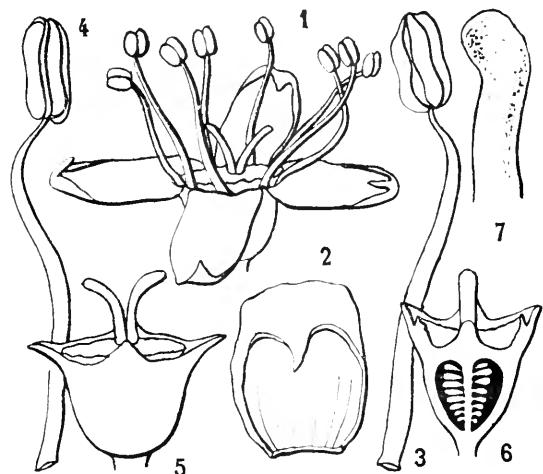


Fig. 17.

Hydrangea integra HAYATA. 1, a flower; 2, a petal; 3, 4, stamens; 5, an ovary; 6, the same in vertical section; 7, apical portion of a style. All figures are magnified.

Hydrangea integra

HAYATA (Fig. 17) Fl. Mont. Formos. p. 90, t. 7; Ic. Pl. Formos. II. p. 5. Descriptio auctata: Folia plantæ novellæ dentata, sed adulta integra. Alabastrum florum globosum 3 cm. in diametro perulis circ. 10 involueratum, perulis membranaceis semi-hyalinis rotundatis breve

denseque flavo-tomentosis (pilis stellatis adpressis) intus tenuiter extus dense pilosis oppositis, extimis minimis semiglobosis latis apice rotundatis 2 cm. latis 1 cm. longis basi subcordatis interioribus magnis rotundatis valde concavis alabastrum florum semi-amplectantibus $2\frac{1}{2}$ cm. longis explicato $3\frac{1}{2}$ cm. latis apice rotundatis vel leviter emarginatis, intimis 2 minoribus plus minus angustioribus. Inflorescentia expansa umbellatim cymosa 8-10 cm. lata 4-5 cm. longa, ramis tomentosis vel glabratiss. Fl. steriles: sepala 2 rotundata integra. Fl. fertiles: calyx tetragono-obconicus, 4-costatus, limbo 4-5 dentato, dentibus obtusis vel rotundatis; petala 4-5; stamina ignota.

HAB. Nantōchō: Rinkihō, leg. T. TANAKA, Juni. 1912.

Hydrangea Kawakamii HAYATA (Fig. 18.) Ie. Pl. Formos. II. p. 6; Fl. Mont. Formos. p. 90, t. S. Descriptio auctata: Pedicelli florum 2-3 mm. longi.

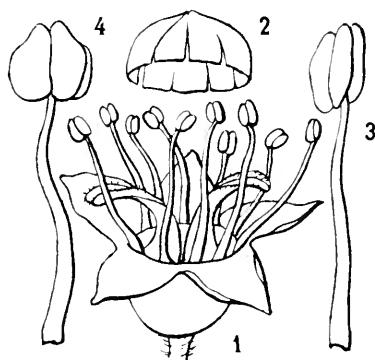


Fig. 18.

Hydrangea Kawakamii HAYATA. 1, a flower, petals taken off; 2, petals nearly uniting into a cap; 3, 4, stamens.

Calycis tubus suburceolato-globosus, 1 mm. longus, $1\frac{1}{2}$ mm. latus, parce pubescens, limbo 5-lobato, lobis dentiformibus triangularibus minus 1 mm. longis obtusis basi dilatatis latis. Petala 5, valvata, apice confluentia in calyptram connata, (calyptra jam anthesin decidua), oblonga 2 mm. longa apice acuta basi perfecte truncata 1 mm. lata glabra apice intus breve corniculata. Stamina circ. 10, filamentis glabris filiformibus, antheris subcordatis minus 1 mm. longis, $\frac{2}{3}$ mm. latis utrinque emarginatis. Styli 2 plus minus recurvati.

HAB. Tandaisan, Aprili. 1910, (Fl.).

Hydrangea macrosepala HAYATA sp. nov. Ramuli novelli glabri fusco-purpurascentes. Folia lanceolata chartaceo-membranacea 8-8 $\frac{1}{2}$ cm. longa 22 mm. lata apice acuminata basi obtusa subintegra vel a medio sursum usque ad prope apicem minute remoteque serrulata, serrulis minutissimis $\frac{1}{3}$ mm.

longis a se 7 mm. remotis, utraque pagine glabra subtus pallidiora, costis supra planis deorsum 1 mm. latis subtus elevatis, venis primariis tenuibus utroque latere costæ 5–6 elevatis, petiolis 8 mm. longis. Cymæ pseudoumbellatae, sessiles, radiis 5, 3 em. longis, pseudoumbellulis (cymulis) multifloratis. Fl. marginalis sterilis in cymula singula unus, pedicellis 2 em. longis; sepala 4 obovato-orbicularia inæqualia, majora 27 mm. longa 23 mm. lata margine sub-integra vel repanda basi \pm unguiculata vel subito cuneata multi-nervia, nervis supra basin convergentibus, venulis tenuibus reticulatis. Flores fertiles: pedicelli $\frac{1}{2}$ em. longi tenuiter pubescentes; calycis tubus obovatus $1\frac{1}{2}$ mm. longus 3 mm. latus, lobis 5 oblongo-triangularibus $\frac{3}{4}$ mm longis $\frac{1}{2}$ mm. latis obtusis basi non contractis 1 mm. a se remotis; petala 5, obovato-oblonga $3\frac{1}{2}$ mm. longa 2 mm. lata apice breve obtuseque cuspidata vel obtusa basi breve cuneata ad basin $\frac{1}{3}$ mm. lata. Stamina 10, filamentis complanatis, antheris ovato-oblongis 1– $1\frac{1}{2}$ mm. longis. Ovarium semi-inferius, stylis 3 subrectis $1\frac{1}{2}$ mm. longis.

HAB. Kōkei, leg. S. NAGASAWA, Aprili. 1903.

Near *H. chinensis*, but differs from it by the quite glabrous subentire leaves and much larger flowers.

Hydrangea obovatifolia HAYATA sp. nov. Rami cinerascentes sub-recti, ramulis novellis rubro-purpurascensibus. Folia coriacea obovata 5– $5\frac{1}{2}$ cm. longa $2\frac{1}{2}$ –3 cm. lata apice triangulare-acuta basi obtusa margine supra basin usque ad infra apicem remote minuteque serrulata, (serrulis mucroniformibus $\frac{1}{2}$ mm. longis 5–6 mm. a se remotis), prope basin et apicem integra supra viridia subtus pallidissima, (costis impressis, venis supra planis, subtus costis elevatis, venis primariis elevatis utroque latere costæ 4–5 a costa angulo 50° egressis, sursum areutatis, venulis non conspicuis) facie supra plana subtus in exsiccato elevato-punctata, petiolis 1 cm. longis supra sulcatis anguste alatis basi \pm dilatatis. Cymæ subumbellatae 4 cm. longæ 7–6 cm. latae basi bracteis multiserratis suffultæ, (bracteis cadueissimis oblongo-triangularibus 3–4 mm. longis 2 mm. latis dorso costatis), sessiles, radiis 5, 3 cm. longis, pseudo-umbellulis (cymulis) ∞ -floratis. Flos marginalis sterilis (pedicellis $1\frac{1}{2}$ cm. longis) in cymula singula unus; sepala 4, valde inæqualia

late orbicularia latiora quam longiora 15 mm. lata 13 mm. longa apice rotundata vel emarginata basi breve unguiculata minora rotundata 6 mm. in diametro, nervis basi omnibus connatis gradatim divergentibus. Flores fertiles: calycis tubus brevior $\frac{1}{2}$ mm. longus obconicus, lobis 5 triangularibus $\frac{1}{2}$ mm. longis totiusque latis. Petala oblonga 3 mm. longa $1\frac{1}{2}$ mm. lata apice obtusa basi late cuneata. Stamina 10, $2\frac{1}{2}$ mm. longa, filamentis glabris \pm complanato-teretibus, antheris ovato-oblongis minus 1 mm. longis utrinque emarginatis. Ovarium fere superius cum stylis 2 mm. longum subconicum, stylis 4-3 1 mm. longis validiusculis apice stigmatoso-marginatis.

HAB. Monte Teraso, prope Kōshūn, leg. B. HAYATA et S. SASAKI, 1912, Juli.

Differs from *H. glabrijolia* by the obovate leaves and broadly rounded sepals of marginal flowers.

Crassulaceæ.

Sedum LINN.

Sedum drymarioides HANCE; FORBES et HEMSL. Ind. Fl. Sin. I. p. 283.

HAB. Formosa: Loco non indicato, leg. U. FAURIE, 1903.

Sedum erythrospermum HAYATA sp. nov. Herba annua? caulis gracilis, ramis divaricatis. Folia ternata vel opposita obovato-spathulata 8 mm. longa $2\frac{1}{2}$ mm. lata apice obtusa deorsum attenuata basi \pm peltata, (partibus productis infra peltam $\frac{1}{2}$ mm. longis), crassiuscula margine integra. Flores laxe cymosi sessiles sub flore singulo foliis 2-3 instructi. Sepala 5 viridissima linearia 2 mm. longa $\frac{1}{2}$ mm. lata apice obtusa. Petala 5 lanceolata 5 mm. longa apice acuto-obtusa 3-nervia. Stamina 10. Carpella 5, in maturo divaricato-dehiscentia basi connata $3\frac{1}{2}$ mm. longa 2 mm. lata apice rostrata, rostris 1 mm. longis. Semina ovoido-ellipsoidea 1 mm. longa utrinque minute apiculata, testa membranacea rubra.

HAB. Monte Morrison, leg. U. MORI.

Sedum obtuso-lineare HAYATA sp. nov. Herba erecta, caules 12 cm. longi in exsiccato 2 mm. lati. Folia irregulariter disposita alterna vel ternata linearia 7 mm. longa 1½ mm. lata apice obtusa. Cymæ terminales 1½ cm. longæ 3 cm. latæ. Sepala 5 linear-lanceolata 4 mm. longa 1½ mm. lata apice obtusa basi subpeltata ultra insertionem ¼ mm. producta. Petala 5 ovato-lanceolata 4½ mm. longa 2 mm. lata apice obovato-acuta ad summum obtusa basi plus minus angustata. Stamina 10. Carpella 5.

HAB. Fokien, leg. S. NAGASAWA, Aprili. 1910.

Sedum microsepalum HAYATA sp. nov. Caulis basi repens ad nodos radicans incrassatus sursum ascendens. Folia alterna spatulata 22 mm. longa 5 mm. lata apice obtusa basi attenuata crassiuscula glabra, (nervis non conspicuis), basi attenuata ad extremitatem rotundato-obtusa 2 mm. lata ultra insertionem ½ mm. producta. Flores cymosi sessiles, ramis divaricatis, bracteis oppositifoliis lanceolato-linearibus obtusis 1½ mm. longis basi dilatatis. Sepala 5 linearia, uno longissimo 4 mm. longo, altra breviora 2 mm. longa ½ mm. lata basi dilatata ¾ mm. lata apice obtusa. Petala 5 basi connata ovato-lanceolata apice acuminata, basi non contracta 5 mm. longa 2 mm. lata apice minute breveque uncinato-cornuta dorso carinato-costata. Stamina 10, altra cum petalis opposita, altra cum iis alterna, circ. 4 mm. longa, filamentis complanatis. Glandulæ 5 cum petalis oppositæ ½ mm. longe totiusque latæ emarginatae. Carpella 5 intus a basi usque ad medium connata spicie acuminata, ad stylos 1½ mm. longos abeuntia, cum stylis 4½ mm. longa.

HAB. Monte Morrisou, Oct. 1908, leg. T. KAWAKAMI et U. MORI.

Sedum Sasakii HAYATA sp. nov. Herba; caulis longe prostratus, basi radices fibrosas emitens, gracilis non crassus tenuis teres ½ mm. in diametro, ramos erectos ascendentes emitens, ramis erectis 5-7 cm. longis sursum foliosis. Folia approximata imbricata alterna ± crassa ovato-oblonga 3 mm. longa 2 mm. lata apice rotundata basi ultra insertionem producta, (partibus productis truncatis 1½ mm. latis ½ mm. longis peltatis) margine integra glabra sessilia. Flores sessiles spicatim 5-6 dispositi 3-4 mm. longi. Sepala 5

oblongo-linearia 3 mm. longa 1 mm. lata, apice rotundato-obtusa basi obtusa peltata, partibus productis $\frac{1}{2}$ mm. longis. Petala 5, obovato-spathulata $3\frac{1}{2}$ mm. longa $1\frac{1}{2}$ mm. lata apice acuta basi \pm angustata medio 1-nervia. Stamina 10, episepala, altris epipetalis supra basin petali affixa, filamentis $1\frac{1}{2}$ mm. longis, altris episepalis longioribus $2\frac{1}{2}$ mm. longis, antheris ellipticis $\frac{1}{2}$ mm. longis apice obtusis vel obscure obtusis. Carpella 5, basi connata, supra basin sursum libera elongato-ovata apice acuminata rostrata $2\frac{1}{2}$ mm. longa, rostris $\frac{1}{2}$ mm. longis. Carpella matura verticillatim patentia, late oblique triangularia $1\frac{1}{2}$ mm. lata $2\frac{1}{2}$ mm. longa apice rostrata. Semina flava, elliptica $\frac{1}{2}$ mm. longa utrinque alis brevissimis producta.

HAB. In litore Denryōyōsha et Shinsha, leg. S. SASAKI, Mai. 1912.

The habit of this plant is nearly the same as that of *S. uniforme* HOOK. f. et ARN., but the flowers are widely different.

Sedum subcapitatum HAYATA sp. nov. Herba perennis, caules erecti 14 mm. longi 4-gono-teretes. Folia alterna obovato-rotundata 28 mm. longa 20 mm. lata apice rotundata basi subito contracto-attenuata (partibus attenuatis 1-2 mm. longis), margine irregulariter subdenticulata vel subintegra in exsiccatu coriacea vivo crassata subtrinervia, venulis longitudinaliter reticulatis. Flores capitato-umbellati, umbellis terminalibus simplicibus, radiis (pedicellis florum) 2 mm. longis. Sepala 5 linearia $1\frac{1}{2}$ mm. longa apice obtusa. Petala oblonga $3\frac{1}{2}$ -4 mm. longa $1\frac{1}{2}$ mm. lata apice acuta deorsum \pm angustiora. Stamina 10. squamæ oblongæ emarginatæ $\frac{2}{3}$ mm. longæ. Carpella 5 omnia soluta distincta lanceolato-fusiformia 3 mm. longa $\frac{2}{3}$ mm. lata apice acuta ad stylum 1 mm. longum abeuntia basi attenuata deorsum \pm incurvata apice \pm recurvata subtriquetra dorso latereque costata interiore dihiscentia. Semina obovooideo-fusiformia cum alis $1\frac{1}{2}$ mm. longa basi truncata apice alis $\frac{1}{2}$ mm. longis terminata, facie minute longitudinaliter reticulata.

HAB. Monte Morrison, ad 13000 ped. alt., leg. U. MORI.

Very distinct for its subcapitate flowers.

Droseraceæ.

Drosera LINN.***Drosera peltata*** SM.; Forbes et HEMSL. Ind. Fl. Sin. I. p. 289.

HAB. Fokien: Kosan, leg. S. NAGASAWA, Aprili. 1910.

DISTRI^B. Tropical and subtropical Asia and Australia.

Hamamelideæ.

Eustigma GARDN.

Eustigma oblongifolium GARDN. et CHAMP. (Tab. XIX.) in BENTH. Fl. Hongk. p. 132; MATSUM. et HAYATA Enum. Pl. Formos. p. 137; HAYATA, Ic. Pl. Formos. II. p. 14. Arborescens? rami et ramuli rugosi cinerascentes, sursum apice fuscentes lenticellis minutis punctati. Folia alterna oblonga vel oblongo-lanceolata 9–13 cm. longa 3–5 cm. lata apice acuminata vel caudata (caudibus acuminatis) basi obtusa vel acuta margine integra vel versus apicem utroque latere 1–2 dentibus instructa, (dentibus acutis ad apicem mucronatis), coriacea supra nitida subtus opaca, costis supra impressis subtus elevatis, venis primariis lateralibus utroque latere costæ 5–6 supra tenuissimis impressis subtus distincte elevatis a costa angulo 50–60° divaricatis, venis secundariis costa transverse dispositis vel inter venas primarias transversis subtus distinctis supra non conspicuis, petiolis 5–10 mm. longis supra subsulcatis, stipulis subulatis 4–5 mm. longis $\frac{1}{2}$ mm. latis caducissimis facie concavo-sulcatis. Flores spicati, spicis terminalibus 2 cm. longis sessilibus vel breve pedunculatis stellato-tomentosis sub flore singulo 1-bracteatis et 2-bracteolatis, bracteis late rotundatis apice rotundatis basi leviter contractis 3–3½ cm. longis 4 mm. latis margine erosis vel integris extus pubescentibus intus glabris vel pubescentibus multinerviis, nervis radiato-parallelis, bracteolis cum bracteis conformibus tubum calycis arete attingentibus. Calycis tubus subsessilis campanulato-globosus 2–3 mm. longus extus pilis stellatis dense obtectus, limbo 5-lobato, lobis rotundato-oblongis valde reflexis 3–3½ mm.

longis $2\frac{1}{2}$ mm. latis subintegris utraque pagine subglabris margine et basi leviter et paucissime pilis stellatis instructis multinerviis, nervis subparallelis. Petala 5, ad faucem tubi calycis affixa, cum lobis calycis alterna, cuneiformia in circumscriptione, 2 mm. longa apice truncata 2-lobata vel emarginata introrse recurvata crassiuscula extus sulcata intus costata vel deorsum angustata supra basin lateraliter compressa latere complanata ad basin \pm dilatata 1 mm. lata utraque pagine glaberrima. Stamina 5, ad basin lobi calycis affixa et iis opposita (episepala), antheris sessilibus vel subsessilibus ovato-rotundatis apice obtusis vel truncatis 1 mm. longis, longioribus quam latioribus, loculis introrsum valvis 2 medio solutis dehiscentibus. Ovarium inferius 2-loculare, loculis 1-ovulatis, ovulis pendulis anatropis; styli 2, in longitudine inaequales, longe exserti, altro 8 mm. longo, altro 12 mm. longo, erecti basi dense medio parce pilis stellatis obtecti, sursum subglabri, ad apicem dilatati tuberculati stigmatosi. Capsula lignosa ovoidea 13 mm. longa 10 mm. lata tenuiter 7-8-costata pilis stellatis obtecta, ad apicem truncata, basi ad stipitem incrassatum abeuns, sursum 2-valvatim loculicide dehiscens, deorsum indehiscens, valvis sursum solutis sed deorsum connatis, endocarpio apice soluto. Semina ovoideo-ellipsoidea 8-9 mm. longa 4-5 mm. lata leviter compressa facie subplana dorso convexa, utraque extremitate obtusa, testa glabra nigricanti subnitida lignoso-crustacea; albumen carnosum; radicula supra brevis, cotyledonibus amplis oblongis 5 mm. longis 3 mm. latis, costis elevatis.

HAB. Nantō: Nankōkei, leg. U. MORI, 1908, Aug. (No. 1193); Jinrin, leg. U. MORI, 1910, Juli.; Hokkōkei, Shohakurin, Holisha, leg. C. ŌWATARI; R. KANAHIRA.

This plant seems slightly different from the species described in BENTH. Fl. Hongk. in having introrse anthers. It is widely distributed in Formosa.

Halorageæ.

Haloragis Forst.**Haloragis tetragyna** HOOK. f.; DUNN. Fl. Kwangt. et Hongk. p. 102.*H. seabra* BENTH. Fl. Hongk. p. 139.

HAB. Fokien: Kosan, leg. S. NAGASAWA, Nov. 1909.

Callitrichæ LINN.**Callitrichæ stagnalis** SCOP.; HAYATA Materials for a Flora of Formosa p. 111.

HAB. Ōkasaki, leg. T. SōMA, Mart. 1912.

Rhizophoreæ.

Ceriops ARN.

Ceriops Candolleana ARN. var. **Sasakii** HAYATA n. v. (Tab. XX.)
 Frutex. Rami glabri teretes, cicatricibus foliorum rotundatis notati, cortice subviridescenti. Folia opposita oblonga obovato-elliptica vel oblonga, coriacea 7 cm. longa 3 cm. lata apice rotundata sensim emarginata basi cuneata utraque pagine glabra supra nitida subtus pallida margine integra leviter desuper recurva, venis lateralibus supra ± elevatis (in exsiccato) subtus inconspicuis rectis a costa angulo 55° divaricatis, venis primariis utroque latere costæ 10–13 prope marginem vena marginali connectis, costis utraque pagine elevatis, petiolis 2 cm. longis teretibus. Cymæ ad axillas foliorum superiorum solitariæ subcapituliformes vel umbelliformes 5–6-floratae, pedunculis 1 cm. longis, pedicellis 1–2 mm. longis, vel floribus subsessilibus ad apicem pedunculorum 5 fasciculatis basi subconnatis, cupulam formantibus, bracteolis apice pedicellorum 2 basi connatis. Sepala 5 basi leviter connata valde crassa oblongo-lanceolata apice triangulari-acuta basi non contracta valvata 5 mm. longa 2 mm. lata erecta non patentia. Petala 5 sepallo breviora 3½ mm. longa 1½ mm. lata in ambitu oblonga apice emarginata ad centrum et utroque

latere apicis aristato-cornuta (cornibus 3 obtusis filiformibus $\frac{1}{2}$ mm. longis), dorso medio costata basi cuneato-acuta ad marginem prope basin villosa. Stamina 10, filamentis $1\frac{1}{2}$ mm. longis, antheris sagittato-lanceolatis $\frac{2}{3}$ mm. longis apice apiculatis. Discus circa ovarium dispositus cupuliformis 10-dentatus, dentibus obtusis cum staminibus alternis. Ovarium semi-inferius superiore liberum, (parte libera conica 1 mm. longa totiusque lata), fere 3-loculare, loculis 2-ovulatis, stylo $1\frac{1}{2}$ mm. longo columnari. Fructus maturi non visi.

HAB. Takao : Zenchinshō, leg. S. SASAKI, Nov. 1911.

Differs from the type in having quite glabrous style.

Myrtaceæ.

Decaspermum FORST.

Decaspermum paniculatum KURZ. (Fig. 19); MATSUM. et HAYATA Enum. Pl. Formos. p. 144; HAYATA Ic. Pl. Formos. II. p. 18.

HAB. Kusukusu, leg. B. HAYATA et S. SASAKI, Juni. 1912.

Eugenia LINN.

Eugenia claviflora ROXB. var. **oblongifolia** HAYATA, n. v. Rami teretes, cortice rubescenti irregulariter fisso, ramulis tetragonis. Folia opposita chartacea oblonga ovato- vel obovato-lanceolata 6 cm. longa $2-2\frac{1}{2}$ cm. lata apice acuta ad summum obtusa basi breviter attenuata costa supra sulcata, subtus elevata, venis lateralibus primariis utroque latere costæ 20-30 tenuissimis impressis subtus tenuissime elevatis haud conspicuis, nervis marginalibus tenuissimis, petiolis 4-5 mm. longis supra sulcatis subteretibus. Flores ignoti. Fructus axillares solitarii breve pedicellati, (pedicellis $\frac{1}{2}$ cm. longis), clavato-cylindracei, circ. 2 cm. longi 8 mm. lati, apice campanulati, basi attenuati, apice tubis calycum 8 mm. longis coronati.

HAB. Kōtōshō, leg. T. KAWAKAMI et S. SASAKI, Juni. 1912.

Differs from the type by the less acuminate obovate leaves.

Eugenia cuspidato-obovata HAYATA sp. nov. Ramuli subtetragoni,



Fig. 19.

Decaspermum paniculatum KUNZ. 1, a branch; 2, a leaf; 3, a flower; 4, a petal; 5, vertical section of an ovary; 6, 7, stamens, seen from different sides. Fig. 1 and 2, $\times \frac{2}{3}$; fig. 3-7, magnified.

vel subteretes, cortice longitudinaliter fisso. Folia opposita obovato-cuspidata vel ovato-cuspidata 5½ cm. longa 27 mm. lata chartacea vel chartaceo-coriacea apice cuspidata ad apicem subacuta vel subobtusa basi cuneato-acuta margine integra, costa supra impressa sulcata subtus acuto-elevata, venis lateralibus supra planis subtus obscure tenuissime elevatis prope marginem vena marginali connectis, petiolis ½ cm. longis supra sulcatis subtus acute costatis. Flores ignoti. Fructus depresso-globosi 6 mm. longi 12 mm. lati apice depresso-impressi basi rotundati in exsiccato-rugosi.

HAB. Kōtōshō, leg. T. KAWAKAMI et S. SASAKI, Juli. 1912.

Near *Eugenia acuminatissima* KURZ., but differs from it by the broader cuspidate leaves.

***Eugenia densissima* MERRILL.**

Compared with a specimen from the Philippines.

HAB. Kōtōshō, leg. T. KAWAKAMI et S. SASAKI, Juli. 1912.

***Eugenia?* *divaricato-cymosa* HAYATA sp. nov.** Rami teretes, cortice cinerascenti, lenticellis non distinctis. Folia lanceolata 19 cm. longa 5½ cm. lata apice acuminata ad summum obtusa basi cuneato-attenuata chartacea margine subintegra vel minute denticulata, costa supra late impressa subtus elevata venis lateralibus primariis utroque latere costæ 12–13 subrectis a costa angulo 50° egressis prope marginem subito flexuosis ad venam proximam superiorem attingentibus subtus tenuiter elevatis supra tenuiter elevatis vel impressis, venulis secundariis grosse reticulatis subtus tenuiter elevatis, breve petiolata, petiolis 2 cm. longis laminam $\frac{1}{6}$ –plo aequantibus subteretibus supra leviter sulcatis. Cymæ axillares 10 cm. longæ 10 cm. latæ 3–4-plo ramosæ, ramis laxis angulo obtuso divaricatis suboppositis, floribus ad apicem ramlorum subternatim dispositis sessilibus. Alabastrum florum turbinatum 6 mm. longum 4 mm. latum apice aristato-aculeatum basi subito attenuatum. Calyx-tubus late campanulatus 4 mm. longus 6 mm. latus apice truncatus, ore integro (partibus ovario adnatis brevissimis 1–½ mm. longis), limbo 4-lobato, lobis connatis mitram aristato-apiculatum formantibus. Petala 4 late oblonga 4 mm. longa apice rotundata vel subacuta margine erosa ad basin 1½ mm. lata

tenuissima utraque pagee globuloso-punctata hyalina. Stamina ∞ , filamentis crispatis 4-5 mm. longis, antheris oblongo-cordatis apice connectivo globuloso terminatis basi 2-lobatis. Ovarium inferius 1- $\frac{1}{2}$ mm. longum 2-loculare, loculis multi-ovulatis, stylo columnari-filiformi 7 mm. longo apice obtuso-punctato.

HAB. Hainan, leg. N. KONISHI, Juni. 1909.

Near *E. similis* MERR., but differs from it by the longer leaves with fewer lateral veins.

Eugenia euphlebia HAYATA sp. nov. Ramuli subteretes vel subtetragoni, (cortice longitudinaliter fisso), subcinerascentes glabri. Folia obovata, 5 cm. longa 2 cm. lata apice cuspidata ad summum obtusa basi cuneata ad petiolum abeuntia coriacea integra (costa supra impressa subtus elevata, venis lateralibus supra non conspicuus subtus tenuiter elevatis rectis prope marginem nervo marginali connectis), subtus minute nigro-punctata supra nitida subtus pallidiora, petiolis 1 cm. longis. Cymæ terminales paucifloratae 2-3-chotome ramosæ, ad apicem ramulorum floribus 2-3 sessilibus. Calyx-tubus ureolato-campanulatus 3 mm. longus, (ore 3 $\frac{1}{2}$ mm. lato), ultra ovarium 2 mm. productus, limbo 4-dentato, dentibus latissimis 2 mm. latis $\frac{1}{2}$ mm. longis obtusissimis. Petala 4 late orbicularia 3 mm. lata 2 $\frac{2}{3}$ mm. longa margine subintegra basi ad insertionem 1 mm. lata. Stamina ∞ , filamentis 3-5 mm. longis, antheris subcordatis $\frac{1}{2}$ mm. longis apice subrotundatis. Stylus columnari-filiformis 6 mm. longus apice obtusus. Ovarium inferius 2-loculare.

HAB. Kusukusu, leg. B. HAYATA et S. SASAKI, Juli. 1912.

Eugenia fluvialis HEMSL. in FORBES et HEMSL. Ind. Fl. Sim. I. p. 296.

HAB. Hainan, leg. N. KONISHI, 1910, Juni.

Eugenia kusukusensis HAYATA sp. nov. Arborescens. Rami teretes, cortice rubescenti vel cinerascenti. Folia opposita oblonga obovato- vel ovato-oblonga vel ovato-lanceolata 9 cm. longa 3 $\frac{1}{2}$ cm. lata apice cuspidato-acuminata ad summum obtusa basi acuto-attenuata margine integerrima chartacea, (costa supra sulcata subtus elevata, venis lateralibus primariis tenuissimis utraque pagee distincte tenuissime elevatis prope marginem

vena marginali connectis), supra parce subtus dense sub lente punctata, petiolis 1 cm. longis. Cymæ dense floratæ 4 cm. longæ 6 cm. latæ, ramis oppositis angulo obtuso divaricatis, floribus ad apicem ramulorum 3-4-natim sessile vel pedicellatim dispositis, pedicellis ultimis 2 mm. longis. Calyx-tubus late campanulatus 3 mm. longus 5 mm. latus ore suberoso. Petala connata non distinete visa. Stamina 8, filamentis filiformibus 1 mm. longis, antheris oblongis late globosis $\frac{1}{3}$ mm. longis subcordatis apice intus connectivis globuliformibus terminatis. Ovarium inferius ad basin tubi calycis situm 1 mm. longum.

HAB. Kusukusu, leg. B. HAYATA et S. SASAKI, Juni. 9, 1912.

Near *Eugenia Millettiana* HEMSL. but differs from it by the densely flowered cymes and leaves.

Melastomaceæ.

Melastoma BURM.

Melastoma sanguineum SIMS. Bot. Mag. t. 2241; FORBES et HEMSL. Ind. Fl. Sin. I. p. 300.

HAB. Hainan, leg. N. KONISHI, 1909, Juni.

Melastoma tetramerum HAYATA, sp. nov. Rami et ramuli teretotetragoni pilis adpressis strigosis obtecti, cortice fusco-rubescenti demum gradatim soluto. Folia opposita ovato-elliptica vel oblonga 4 cm. longa $1\frac{1}{2}$ cm. lata chartacea apice acuta basi obtusa margine integra supra adpresse regulariter pilosa subtus dense adpresse pilosa distinete 3-nervia, præterea 2-marginalibus tenuibus instructa, nervis omnibus subparallelibus deorsum \pm divergentibus sursum convergentibus ad apicem foliorum attingentibus supra subimpressis subtus elevatis dense adpresse pilosis, petiolis 7 mm. longis supra sulcatis subteretibus. Flores ad apicem ramulorum axillarium solitarii vel terminales, pedunculis 1-2 cm. longis. Calyx-tubus globosourceolatus 7 mm. longus latior quam longior extus adpresse pilosus basi rotundatus, ore plus minus contracto, limbo 4-lobato, lobis triangulari-lanceolatis

12 mm. longis basi latissimis 5 mm. latis extus adpresso strigoso-pilosis intus glabris, sed sursum adpresso pilosis. Petala 4 obovato-rotundata 22 mm. longa 18 mm. lata apice rotundata basi contracto-unguiculata, (unguis 2 mm. longis), margine sub lente minute ciliolata. Stamina 8, iis cum petalis alternis longioribus, iis cum petalis oppositis brevioribus; stamna longiora: filamentis 7 mm. longis complanatis 1 mm. latis cum connectivis angulo recto articulatis, connectivis basi antheræ longe productis (partibus productis 9 mm. longis 1 mm. latis complanatis prope basin cum filamentis articulatis) basi facie 2-cornuto-calcaratis, calcaribus obtusis 2-cornutis 1 mm. longis, antheris linearibus complanatis 7-8 mm. longis basi 1½ mm. latis apice obtusis basi 2-lobatis facie undulatis dorso planis apice 1-porosis; stamna breviora: filamentis 6½ mm. longis complanatis cum connectivo angulo recto articulatis, connectivis ultra basin antheræ productis, partibus productis 1 mm. longis recurvis basi facie 2-cornuto-calcaratis, antheris ovato-linearibus 6 mm. longis basi 1½ mm. latis apice obtusis basi 2-lobatis facie transverse undulato-rugosis. Ovarium ovato-globosum 5 mm. longum cum calyeis tubo adnatum sursum liberum strigoso-tomentosum apice ad centrum stylum elongatum emittens, 4-loculare, loculis 8-ovulatis, stylo columnari-filiformi 18 mm. longo apice truncato obtuso.

HAB. Bonin: Chichijima-Hatsunejima, Juli. 1905, leg. H. HATTORI.

Very distinct for its tetramerous flowers and its leaves which are much smaller than those of any species of the genus.

Bredia BLUME.

Bredia Oldhami HOOK. f. (Fig. 20.); HAYATA Ic. Pl. Formos. I. p. 24.

Bredia scandens HAYATA (Tab. XXI.), Ic. Pl. Formos. I. p. 24. Suffrutex scandens vel erecta cire. 1 mm. longa, canlis subteres vel subtetragonus in vivo purpureo-rubescens, in exsiccato nigricans, patento-hirsutus, (pilis transverse patentibus), 2-2½ mm. in diametro sectionis, paucis-ramosus. Folia opposita longe petiolata ovato-cordata 7½ cm. longa 4½ cm. lata apice acuminata vel ad summum obtusa ad centrum minute mucronata margine subintegra et mucronato-dentieulata, (dentibus mucroniformibus brevissimis



Fig. 20.

Bredia Oldhami Hoo. f. 1, a branch; 2, a flower, stamens and petals taken off; 3, a petal; 4, 5, 6, stamens of one kind, seen from different sides; 7, 8, 9, stamens of the other kind, seen from different sides; 10, an ovary, in vertical section; 11, 12, seeds, seen from different sides. 1, $\times \frac{2}{3}$; 2-12 more or less magnified.

$\frac{1}{2}$ mm. longis 1–2 mm. a se distantibus), vel in folio novello ciliolata, basi cordata vel acuta chartacea supra toto glabra subtus ad nervos venasque tenuiter pubescentia supra subviridia subtus pallido-purpurascens 7-nervia, nervis versus utrasque extremitates convergentibus, venis secundariis inter nervos transversis venulis reticulatis, nervis et venis supra planis subtus prominentibus, petiolis $3\frac{1}{2}$ –4 cm. longis lamina \pm brevioribus estipulatis. Cymæ vel paniculato-cymæ terminales 7 cm. longæ 5 cm. latæ, ramis oppositis. Flores subdeclinati, pedicellis breve denque pubescentibus, pilis glandulosis apice globuliferis. Calyx-tubus oboconico-tetragonus basi gradatim attenuatus ad pedicellum abeunt 4 mm. longus totiusque latus, limbo 4-lobato, lobis late triangularibus vel subeupspidiformibus 2 mm. longis sinibus inter lobos latis rotundatis cum tubo extus glanduloso-pubescentibus. Alabastrum floris tetragono-ovoideo-fusiforme apice acutum. Petala 4, 2-superiora minora, 2-inferiora majora, albo-purpurea oblique rotundato-ovata circ. 8 mm. longa totiusque lata apice rotundato-acuta subcalloso-mucronata basi lato-truncata ad insertionem contracta $\frac{1}{2}$ mm. lata margine integra, (nervis et venis grosse reticulatis), extus \pm pubescentia intus glabra. Stamina 8, ad faucom tubi calycis affixa, ea lobis calycis opposita longiora, ea lobis calycis alterna breviora, declinata; stamina longiora valde declinata purpurascentes filamentis complanatis 8 mm. longis glabris, antheris linearibus cum tubo 7 mm. longis deorsum \pm latioribus sursum angustissimis apice in tubum 1 mm. longum 1-porosum abeuntibus, basi in auriculaum 2-lobatum 1 mm. longum cum filamentis connatum productis, toto glabris; stamina breviora $6\frac{1}{2}$ mm. longa, filamentis 3 mm. longis complanatis glabris, antheris albicantibus linear-fusiformibus 3 mm. longis basi latioribus apice in tubum 1 mm. longum 1-porosum attenuatis, basi antice breve 2-auriculatis (auriculis liberis $\frac{1}{2}$ mm. longis postice brevissime 1-calearatis vel obscuris. Ovarium apice in tubum 1 mm. longum margine ciliolato-denticulatum $1\frac{1}{2}$ mm. latum productum. Stylus columnaris $4\frac{1}{2}$ mm. longus apice obtuso-truncatus. Capsula loculicide dehiseens tetragono-obconica, lobis calycis persistentibus; tubus partis productæ ovarii in fructu late campanulato-patelliforme expansus apicem fructus coronans. Semina seobiformia oblique angulato-ovoidea $\frac{1}{2}$ mm. longa testa elegante

verrucosa latere uno et utraque extremitate breve subalata facie globulis minutis dense dispersa.

HAB. Ubique in montibus 2000-3000 ped. alt.; inter Karapin et Fun-kiko, leg. B. HAYATA et S. SASAKI, Jan., 1912.

Very near *Bredia hirsuta* BLUME but distinguishable by the longer anthers, longer styles and especially by the absence of dorsal tubercles at the base of the longer anthers.

Sarcopyramis WALL.

Sarcopyramis delicata C. B. ROBINSON, in Bull. Torr. Bot. Club. 35 (1908) pp. 72 et 75, et in Philip. Journ. Scien. (1910) p. 368.

Sarcopyramis nepalensis HAYATA Fl. Mont. Formos. p. 98; Ic. Pl. Formos. II. p. 24, (non WALL.)

Compositæ.

Eupatorium LINN.

Eupatorium gracillimum HAYATA sp. nov. Rami rubescentes glabri minute longitudinaliter striati, ramulis gracillimis teretibus remote foliatis, foliis a se 4 mm. remotis. Folia opposita triangulare-oblunga vel triangularia in circumscriptione, 3-3½ cm. longa 2 cm. lata apice caudato-acuminata basi late truncata vel rotundato-truncata margine dentato-serrata, (dentibus ascendentibus obtusis), prope basin subintegra basi ad extremitatem plus minus acuta membranacea utraque pagine minute pubescentia 3-nervia vel 5-nervia, petiolis 4 mm. longis. Capitula dense cymosa, cymis 5-7 cm. longis 3-5 cm. latis terminalibus ramosis, ramis angulo obtuso divaricatis capitulis dense dispositis, pedicellis brevibus 1 mm. longis vel longioribus, ramis et ramulis dense pubescentibus, bracteis minutis linearibus vel oblongis 1 mm. longis obtusis tenuiter pubescentibus. Involuci cylindracei 4½ mm. longi 2 mm. lati, bracteis 7-10 extimis minoribus interioribus longioribus intimis longissimis, extimis ovatis obtusis margine ciliolatis 1 mm. longis intimis spathulato-linearibus 3½ mm. longis 1 mm. latis apice

obtusis margine minute ciliolatis extus superiore pubescentibus cæterum glabris. Flores in capitulum singulum 5, cum stylo 7 mm. longi. Corolla cylindrica 3 mm. longa apice latiora basi attenuata apice 5-loba, lobis brevibus $\frac{1}{3}$ mm. longis triangularibus erecto-patentibus dorso minute glanduloso-punctatis. Antheræ 1 $\frac{1}{4}$ mm. longæ apice appendiculatæ basi obtusæ. Rami styli longe exserti corollam in longitudine æquantes; styli basi leviter dilatati (partibus dilatatis apice dense barbatis, barbis rubris) ad extremitatem contracti cum stylophoris articulati. Ovarium clavato-lineare. Setæ pappi albæ 2-seriatæ 3 mm. longæ seabrae.

HAB. Kōshūn: Kuraru et Kusukusu, leg. B. HAYATA et S. SASAKI, Juni. 1912.

Near *E. Tushiroi* HAYATA; but differs from it by the much more deeply dentate leaves, more slender habit, and after all by the barbate base of the styles.

Vacciniaceæ.

Vaccinium LINN.

Vaccinium bracteatum THUNB.; FORBES et HEMSL. Ind. Fl. Sin. II. p. 14: MATSUM. Ind. Pl. Jap. II. p. 466.

HAB. Hokuto, T. KAWAKAMI! 1913.

DISTRIB. China, Japan and Eastern India.

This is the first record of the species from Formosa which is represented by a specimen exactly like the Japanese. That plant which was recorded from the island by Dr. A. HENRY and enumerated by myself in our previous works is perhaps not the same as the Japanese. Here is another specimen which has a rather different aspect from the type. But, so far as floral parts are concerned, it may be probably referable to the same species or may be a variety of it.

var? Folia oblonga vel ovato-oblonga vel rhomboideo-oblonga usque ad 3 $\frac{1}{2}$ cm. longa 18 mm. lata utrinque acuta margine serrulata, (costis et venisque supra planis, subtus prominente distineteque elevatis), prope basin margine integra petiolis brevibus 2-3 mm. longis. Bracteæ oblongo-lanceolatæ multo minores quam iis specierum Japonicarum, 3 mm. longæ, pubescentes, bracteolis

linearibus 2 mm. longis. Calycis tubus 1 mm. longus, lobis acutis pubescentibus. Corolla tubulosa extus pubescentia apice urceolata 5 mm. longa 3 mm. lata apice 5-lobata, lobis recurvis. Stamina 10, filamentis basi barbatis, antheris linearibus 2 mm. longis, loculis supra basin sursum distinctis, ecalcaratis.

HAB. Poroporosha, leg. U. MORI, JUNI. 1912.

Vaccinium bracteatum THUNB. var. **longitubum** HAYATA n. v.

Rami teretes graciles cinerascentes. Folia alterna coriacea obovato-oblonga vel obovato-rhomboidea apice acuto-acuminata vel breve acuminata basi acuta vel acuto-attenuata usque 5 cm. longa 2 cm. lata margine obscure vel tenuissime serrulata vel crenulata, (costis supra tenuiter elevatis subtus prominentibus, venis primariis lateralibus supra non visis subtus distincte elevatis), supra nitentia subtus pallida ad costas remote glanduloso-punctata. Racemi axillares vel terminales usque ad 3 cm. longi, floribus patentibus interdum subnutantibus subsecundis, pedicellis 1-2 mm. longis, bracteis et bracteolis multo minoribus quam iis speciei typicæ, rhachidibus et pedicellis toto pubescentibus, bracteis angustatis 2 mm. longis $\frac{2}{3}$ mm. latis acutis pubescentibus, bracteolis 2 elongato-triangularibus 1 mm. longis pubescentibus. Calycis tubus globoso-campanulatus 1 mm. in diametro vel latior pubescens latere rarius glandula 1 instructus, (glandulis rotundatis eupuliformibus), interdum eglandulosus, limbo 5-dentato, dentibus remotis inter se $\frac{2}{3}$ mm. latis triangularibus $\frac{1}{3}$ mm. longis. Corolla cylindracea apice tubi plus minus contracta 8 mm. longa $2\frac{1}{2}$ mm. lata, tubo extus pubescenti intus deorsum hirsuto sursum glabro, limbo brevissimo 1 mm. longo 5-lobato, lobis triangularibus 1 mm. longis totiusque latis apice obtusis reflexis. Stamina 10, 2-seriatim disposita, iis lobis corollæ alternis longioribus, iis lobis corollæ oppositis brevioribus, 5-6 mm. longis, filamentis 3 mm. longis complanatis basi barbatis, antheris linearibus cum tubo loculi 2-3 mm. longis apice in tubos 2 distinctos circ. 2 mm. longos productis ecalcaratis. Ovarium inferius 5-loculare? apice barbis erectis dense obtectum. Styli columnares 7 mm. longi 5-angulati ad angulos subalati apice truncati stigmatosi.

HAB. Montibus in Nantō, leg. U. MORI, JULI. 1909.

Differs from the type in having much longer corolla-tubes.

Vaccinium caudatifolium HAYATA sp. nov. (Tab. XXII.) Frutex epiphytica usque 1 mm. alta. Rami cinerascentes glabri longitudinaliter rugosi lenticellis parce notati recti, ramulis parcissime hirsutis. Folia alterna chartacea vel chartaceo-coriacea vel coriacea ovato-lanceolata vel ovato-oblonga usque 9 cm. longa $2\frac{1}{2}$ -3 cm. lata apice acuminata vel caudato-acuminata (caudibus interdum linearibus) basi obtusa acuta ad extremitatem subto attenuata ad petiolum brevem abeuntia margine integerrima leviter desuper recurvata vel non recurvata supra viridia nitida subtus opaca pallidissima, (costa tenui utraque pagine elevata, venis lateralibus primariis supra tenuissime distineteque elevatis subtus obseuris non visis utroque latere costæ 5-7 angulo acuto a costa divaricatis), petiolis brevissimis 3 mm. longis complanatis subalatis. Alabastrum racemi axillare ovoidem 1-1 $\frac{1}{2}$ cm. longum perulis multis obtectum, perulis eaducissimis, extimis minimis cuspidato-triangularibus margine ciliolatis coriaceis sterilibus, interioribus magnis ovato-cuspidatis apice margine revolutis medio coriaceis, margine tenuibus ciliatis sterilibus, intimis tenuioribus involventibus racemum amplectantibus. Racemi apertientes 1 $\frac{1}{2}$ -2 cm. longi petiolum duplo vel triplo in longitudine aequantes 10- vel pauciore-florati glabri sub-sessiles, sub pedicello singulo 1-bracteati et 2-bracteolati, bracteis ovato-cuspidatis (cuspidibus reflexis) 8 mm. longis 5-6 mm. latis glabris margine ciliolatis, bracteolis linearibus 6 mm. longis 1 mm. latis apice cuspidatis reflexis margine longe ciliatis. Flores apertientes non visi, in alabastro 7 mm. longi pedicellati, pedicellis 2-3 mm. longis glabris apice \pm annulariter dilatatis cum calyce floris articulatis. Calycis tubus urceolato-campanulatus 1 $\frac{1}{2}$ mm. longus 5-lobatus, lobis elongato-triangularibus 2 $\frac{1}{2}$ mm. longis basi 1 $\frac{1}{2}$ mm. latis apice acutis. Corolla in alabastro oblongo-conica 5 mm. longa 3 mm. lata extus glabra intus sursum hirsuta. Stamina 10, 5 mm. longa filamentis 2 mm. longis barbatis complanatis, antheris cum tubis 4 mm. longis linearibus apice in tubos 2 distinctos 2 $\frac{1}{2}$ mm. longos productis apice tubi introrse 1-porosis (poris linearibus 1 mm. longis) basi tubi dorso 2-calcaratis, calcaribus superne recurvis circ. 1 mm. longis ab anthera angulo recto divaricatis. Stylus columnaris 4 mm. longus. Ovarium inferius 10-loculare. Racemi fructiferi 2 $\frac{1}{2}$ cm. longi. Bacca urceolato-globosa 6 mm. longa 5 mm. lata apice

contracta, calycis lobis persistentibus coronata, ad summum leviter depressa, atro-rubra vel purpureo-rubra glabra. Semina elongato-ellipsoidea leviter obliqua elegante reticulata $1\frac{1}{2}$ mm. longa $\frac{2}{3}$ mm. lata utraque extremitate maculato-fuscentia, testa membranacea; embryo cylindricus 1 mm. longus teres, cotyledonibus parvis radicula æquilatis.

HAB. Baatankei, leg. U. MORI, Juli. 1912; Montibus Arisan: Ninnandaira, ad trunco *Querci* sp. Jan., 1912, leg. B. HAYATA et S. SASAKI.

Near *Vaccinium urceolatum* HEMSL. (in Ind. Fl. Sin. II. p. 16.), but differs from that in the leaves which are in the new species acute or obtuse at the base.

Vaccinium parvibracteum HAYATA sp. nov. Rami vel ramuli graciles cinerascentes. Folia ovato-oblonga vel oblonga usque 8 cm. longa 3 cm. lata apice acuminata ad summum aristata basi obtusa rotundata coriacea subtus ad costam remote glanduloso-punctata margine minute mucronato-serrulata, (serrulis vel mucronibus brevissimis a se 2-3 mm. remotis ascendentio-recurvis), (costis et venis supra planis subtus distinete elevatis, venis lateralibus primariis utroque latere costæ 9-10 angulo 60° divaricatis) subtus pallida, petiolis brevissimis 3 mm. longis. Racemi axillares vel terminales 7-8 cm. longi divaricati ascendentis a supra basin usque ad apicem floriferi, perulis basi racemorum 5-6 fuscento-rubris rotundato-triangularibus 2 mm. longis totiusque latis vel latioribus apice breve cuspidatis margine erosis, bracteis sub pedicello singulo singulis ovato-rhomboideis concavis 3-4 mm. longis $2\frac{1}{2}$ mm. latis glabris dorso obscure costatis (costis apice ad cuspidem brevam $\frac{1}{3}$ mm. longam abeuntibus) apice acutis basi infra medium subito cuneato-angustatis basi 1 mm. latis margine eroso-denticulatis parte cuneata basilari integris utraque pagine glabris, bracteolis 2 ad pedicellos remote sitis cuspidato-ovato-rhomboideis $1\frac{1}{2}$ mm. longis $\frac{3}{4}$ mm. latis apice cuspidatis basi cuneatis basi $\frac{1}{2}$ mm. latis margine utroque latere 1-2 dentibus instructis utraque pagine glabris, pedicellis 2-3 mm. longis divaricatis descendento-recurvis apice cum calyce articulatis, floribus erectis vel nutantibus subsecundis. Calyx late campanulatus $2\frac{1}{2}$ mm. longus 3 mm. latus, tubo late obconico 1 mm. longo, limbo 5-lobato, lobis majoribus late triangularibus vel rotundato-triangularibus $1\frac{1}{2}$ mm. longis totiusque latis apice acutis vel breve cuspidatis margine eroso-integris. Corolla

apertiens non visa, in alabastro oblonga utraque glabra apice acuta 7 mm. longa 4-4½ mm. lata, tubo 6 mm. longo, lobis 1 mm. longis obtusis triangularibus clavis. Stamina 10, 5 mm. longa, filamentis 2 mm. longis barbatis, antheris linearibus (cum tubo) 3 mm. longis basi 2-lobatis apice in tubos 2 distinctos 2 mm. longos productis apice tubi introrse 1-porosis, (poris obliquis elongatis ½ mm. longis) dorso basi ad insertionem filamentorum 2-calcaratis, (calcaribus setosis ascendentibus 1 mm. longis vel longioribus sub lente minute aristato-punctatis), facie sub lente minute aristato-punctatis. Ovarium semi-inferius, superiore semiglobosum elevatum sursum 10-loculare, (ovulis in loculo 1-seriatim dispositis), medio et deorsum 5-loculare, (ovulis loculo 2-seriatim dispositis) apice glabrum, stylo columnari 6 mm. longo glabro apice truncato.

HAB. Fokien: Mt. Kosan, leg. S. NAGASAWA, Aprili. 1910. (No. 234.)

Near *V. Donianum* WIGHT. var. *hangchowense* MATSUDA, but differs from it by the much smaller bracts ad bracteoles and much longer spurs of the anthers.

Vaccinium randaiense HAYATA Mater. Fl. Formos. p. 168. Descriptio auctata: Corolla cylindrica 6 mm. longa 3 mm. lata extus intusque glabra, limbo brevissimo 5-lobato, lobis rotundatis 1 mm. longis totiusque latis extrorse recurvis. Fructus inceolato-globosus 5-6 mm. in diametro exsiccato fusco-flavescens. Semina oblique elliptica 1½ mm. longa 1 mm. lata plus minus complanata vel irregulariter angulata, testa obscure reticulata flavescenti.

Described from a specimen collected by Mr. T. Dot in April, 1912, in the experimental Forest in Formosa.

Ericaceæ.

Rhododendron LINN.

Rhododendron breviperulata HAYATA sp. nov. Rami graciles recti pilis squamiformibus dense obtecti cicatricibus foliorum obtriangularibus notati. Folia oblonga vel rarius ovato-oblonga vel obovato-oblonga mediocria 3 cm. longa 13 mm. lata chartacea apice obtusa ad summum callosa-apiculata

basi obtusa sed ad extremitatem abrupte attenuata ad petiolum abeuntia, supra parce scabra adpresse hirsuta subtus adpresse hirsuta, pilis ad paginam superiorem brevioribus, iis ad paginam inferiorem longioribus supra costis et venis planis venis reticulatis impressis, subtus costis et venis tenuiter elevatis pilis dense obtectis venis reticulatis non elevatis sed conspicuis, facie supra fuscentia, subtus pallidiora. Flores saepe geminatim vel ternatim ad apicem ramulorum terminales, perulis brevibus involuerati, perulis late ovatis apice cuspidatis margine ciliatis extus medio hirsutis intus glabris, pedicellis 6 mm. longis dense hirsutis. Calyx 5-partitus, segmentis oblongo-rotundatis $1\frac{1}{2}$ mm. longis 1 mm. latis margine longe ciliolatis intus glabris extus dense hirsutis, pilis 2 mm. longis rectis. Corolla infundibuliformis $1\frac{1}{2}$ cm. longa vel longiora 5-lobata. Staminum filamenta inaequalia cir. 18 mm. longa deorsum parcissime hirsuta, antheris oblongo-linearibus $1\frac{2}{3}$ mm. longis $\frac{2}{3}$ mm. latis apice truncatis 2-porosis 2-lobatis basi acutis apiculatis. Ovarium ovoideo-conicum $1\frac{1}{2}$ mm. longum pilis longiusculis rectis dense obtectum, stylis 2 cm. longis basi hirsutis apice dilatatis, stigmatibus terminalibus.

HAB. Nantō, Mt. Pusasai, leg. U. MORI, 1909, Aprili.

Remarkable for the styles which are pilose at the base and dilated at the apex and oblong linear anthers which are apiculated at the base.

Rhododendron caryophyllum HAYATA sp. nov. (Tab. XXIII.) Frutex.

Rami cinerascentes ternatim ramosissimi, ramulis ternatis sursum squamis lanceolato-triangularibus $1\frac{1}{2}$ mm. longis dense obtectis, cicatricibus obtriangularibus 1 mm. latis approximativis notatis. Folia ut videntur subpersistentia versus apicem ramulorum approximativis alternatim disposita ovato-oblonga 2 cm. longa vel longiora 1 cm. lata vel latiora coriacea margine integra desuper recurva supra scaberrimo-hispida, subtus adpresse strigoso-pilosa, (pilis longiusculis circ. 1 mm. longis densiusculis, iis ad costas latiusculis subsquamiformibus $1\frac{1}{2}$ mm. longis $\frac{1}{6}$ mm. latis), (costis venis venulisque supra impressis distinctis reticulatis, areolis intra reticula elevatis, subtus costis prominente venis tenuiter elevatis venulis ultimis distincte minute reticulatis \pm impressis, areolis intra reticula elevatis) apice obtusa ad centrum breve

calloso-mucronato-apiculata basi obtusa, petiolis 4 mm. longis semi-teretibus supra planis, pilis squamæformibus obtectis. Alabastrum florum perulis obtectum, perulis extimis minoribus, medionis magnis late rotundatis 7 mm. longis 1 em. latis alabastrum florum perbecte amplectantibus margine ciliatis intus glabris extus pilosis, intimis angustioribus spathulatis 7 mm. longis basi attenuatis apice obtusis intus glabris extus adpresso longe denseque pilosis. Flores ad apicem ramulorum terminaliter 2-3-aggregati, pedicellis 4 mm. longis pilis squamæformibus dense obtectis. Calyx 5-lobatus, lobis rotundato-oblongis utrinque obtusis margine longe ciliatis (ciliis $1\frac{1}{2}$ mm. longis) intus glabris extus pilis squamæformibus dense obtectis. Corolla 12 mm. longa 7 mm. lata leviter declinata vel suberecta, lobis 5 subpatentibus vel suberectis oblongis 7 mm. longis 5-6 mm. latis apice obtusis vel rotundatis, duobus medio purpureo-punctato-maculatis, utrinque glabris. Stamina 10 inæqualia, filamentis 8-13 mm. longis inferiore parce hirsutis superiore glabris complanatis, antheris rotundato-obcordatis $1\frac{1}{3}$ mm. longis 1 mm. latis apice 2-lobatis basi obtusis leviter emarginatis 2-porosis. Ovarium globoso-conicum 2 mm. longum totiusque latum, pilis latiusculis dense obtectum, stylo plus minus declinato 12 mm. longo basi usque ad medium longe piloso superiore glabro, stigmate terminali \pm dilatato.

HAB. In Montibus Centralibus, leg. U. MORI, 1909.

Rhododendron (*Eurhododendron*) **ciliato-pedicellatum** HAYATA sp. nov. Rami cinerascentes glabri. Folia ad apicem ramorum approximativi sita obovato-oblonga 10 cm. longa 4 cm. lata supra medium latissima apice breve acuminata ad summum angustissime subaristata basi obtusa vel obtuse acuta utraque facie glabra supra in speciminibus nostris glauciuscula subtus opaca pallidissima, (costis supra impressis subtus prominentibus, venis utraque facie tenuiter elevatis) subtus distincte laxe reticulata tenuiter coriacea vel coriaceo-chartacea, (venis et venulis subtus rubescentibus), margine integerrima leviter desuper recurva, petiolis 2 cm. longis supra angustissime sulcatis glabris apice angustissime alatis. Flores ad apicem ramorum sensu stricto 3-5-fasciculati, fasciculo solitario terminali multi-perulato, perulis extimis late obovatis minutis, interioribus majoribus obovato-spathulatis circ. 3 em. longis, intimis

longissimis $3\frac{1}{2}$ cm. longis 5 mm. latis spathulato-linearibus apice obtusis, omnibus apice dense ciliatis castaneis glabris vel subglabris margine sursum denticulatis, bracteolis lineariformibus $2\frac{1}{2}$ –3 cm. longis apice dense ciliatis, pedicellis 2 cm. longis glanduloso-ciliatis præterea minute pubescentibus. Calyx subglaber alte 5-lobatus, lobis ovato-oblongis vel ovato-lanceolatis ad basin latissimis in longitudine inæqualibus apice 2-setoso-lobatis vel laciniatis cire. 4 mm. longis basi $1\frac{1}{2}$ mm. latis minute ciliolatis vel ciliis obsoletis. Corolla late campanulata basi hypocrateriformis $5\frac{1}{2}$ cm. longa alte 5-lobata, lobis $3\frac{1}{2}$ cm. longis ovato-oblongis utraque pagine glabris. Stamina 10, filamentis in longitudine inæqualibus basi glabris supra basin usque ad vix infra medium hirsutis medio sursum glabris, antheris obovato-oblongis $3\frac{2}{3}$ mm. longis $1\frac{2}{3}$ mm. latis apice obtusis brevissime lobatis basi obtusis emarginatis. Ovarium cylindraceum 8 mm. longum 2 mm. latum brevissime tenuissimeque pubescentis tenuissime 5-sulcatum, stylo glabro 3 cm. longo apice dilatato, stigmate terminali brevissime 5-lobato, lobis brevissimis rugosis.

HAB. Fokien: Mt. Isau, leg. S. NAGASAWA, 1910, April. (Fl.)

Near *R. Westlandii* HEMSL. (Ind. Fl. Sin. II. p. 31); but differs from it by the shortly cuspidate apex of the leaves; from *R. Simiarum* HANCE by the ciliate peduncles.

Rhododendron formosanum HEMSL. in Kew Bullt. p. 183 (1895).

HAB. Formosa: loco non indicato, leg. U. MORI, 1912, Aug.

Rhododendron gnaphalocarpum HAYATA sp. nov. Rami ultimi glaberrimi rubescentes. Folia ad apicem ramulorum fasciulata oblonga membranacea 3 cm. longa $1\frac{1}{2}$ cm. lata apice obtuso-acuta brevissime calloso-obtusa basi obtusa vel acuta utrinque pilis brevibus tenuibus obtecta, supra fuscantia subtus pallida, subtus reticulis venularum conspicuis, petiolis brevioribus 3 mm. longis. Peruli alabastri florum multisériati, intimi longissimi oblongi obtusi 1 cm. longi extus breviter hirsuti intus glabri. Flores terminales quasi-solitarii, pedicellis 1 cm. longis molle pubescentibus. Calyx brevissimus 1 mm. longus non lobatus margine integer dense sericeo-hirsutus. Corolla late campanulata purpurascens 3 cm. longa, lobis 5 patentibus oblongis. Stamina

8, filamentis glabris 2 cm. longis antheris ellipticis 2 mm. longis $1\frac{1}{2}$ mm. latis apice truncatis 2 porosis basi emarginatis. Ovarium elongato-ovoideum $3\frac{1}{2}$ mm. longum densissime molle sericeo-tomentosum, pilis albis, stylo 3 cm. longo glaberrimo apice dilatato, stigmate terminali.

HAB. Fokien: Isan, leg. S. NAGASAWA, 1910, April. (No. 239).

Near *R. Weyrichii* MAXIM.; but differs from it by the pure snow white hairs on the ovary and by the oblong leaves; from *R. dilatum* by the more densely hairy ovary; and from *R. rhombicum* by the entirely glabrous styles.

Rhododendron hyperythrum HAYATA sp. nov. Rami glabri fusco-purpurascens. Folia elliptico-lanceolata usque ad 10 cm. longa $2\frac{1}{2}$ –3 cm. lata apice acuta vel breve acuminata vel cuspidata ad summum callosa-acuta basi acuta vel obtusa, margine integerima coriacea supra glabra subtus fulvo-rubescens lepidota, (costis supra impressis subtus prominentibus, venis lateralibus primariis supra leviter impressis, subtus leviter elevatis, utroque latere costae 10–13 interdum obscuris), margine leviter desuper recurva, petiolis $1\frac{1}{2}$ – $2\frac{1}{2}$ cm. longis supra angustissime sulcatis. Flores 7–8 quasi-terminaliter quasi-fasciculatim dispositi, perulis multi-seriatis inferioribus minutis cuspidiformibus, infimis longissimis obovato-oblongis pedicellum in longitudine superantibus 2– $2\frac{1}{2}$ cm. longis 1 cm. latis extus sericeo-tomentosis intus subglabris vel sursum pubescentibus apice breve acutis, bracteolis filiformibus 1 cm. longis, pedicellis 2 cm. longis brevissime hirsutis. Calyx subplanus 5-dentato-lobatus, lobis triangularibus apice obtusis extus glanduloso-hirsutis intus glabris latissimis $\frac{1}{2}$ mm. longis. Corolla campanulata 3 cm. longa 4 cm. in diametro 5-lobata, lobis latis rotundatis leviter emarginatis. Stamina 10 in longitudine inaequalia inclusa, filamentis basi pilis brevissimis hirsutis, antheris oblongo-rectangularibus apice truncatis 2 porosis basi breviter 2-lobatis. Ovarium cylindrico-ovoideum 3 mm. latum, pilis brevibus glandulosis dense obteatum 5-sulcatum, stylo $2\frac{1}{2}$ cm. longo 5-sulcato prope basin pilis glandulosis brevibus instructo apice dilatato-campanulato, stigmate terminali.

HAB. Formosa: regionibus meridionalibus, leg. N. KONISHI.

Near *R. Morii* HAYATA, differs from it by the leaves which are densely reddish lepidoted on the under side.

Rhododendron indicum SWEET var. **eriocarpum** HAYATA n. v. Rami pilis squamiformibus dense obteeti. Folia oblonga vel obovato-oblonga $2\frac{1}{2}$ cm. longa $1\frac{1}{2}$ cm. lata membranaceo-chartacea supra pilis adpressis parce obtecta subtus pilis adpressis longiuseulis obteeta, subtus ad costas et venas densiuscule pilosa, pilis fulvis, petiolis 5 mm. longis dense pilosis. Flores 2-3-4 fasciculati terminales, pedicellis 1 em. longis dense pilosis. Calycis lobi rotundato-oblongi $1\frac{1}{2}$ mm. longi $1\frac{1}{3}$ mm. lati apice rotundati margine longe ciliati, (ciliis 2 mm. longis) extus pilosi. Corolla campanulata $3\frac{1}{2}$ em. lata 5-lobata, lobis oblongis apice rotundatis. Stamina 9-10 inaequalia, filamentis deorsum hirsutis, antheris oblongo-ellipticis $2\frac{1}{2}$ mm. longis 1 mm. latis apice lobatis truncatis 2-porosis basi obtusis. Ovarium cylindrico-conicum $3\frac{1}{2}$ mm. longum, pilis 2 mm. longis dense obtectum, stylo glabro 3 mm. longo apice \pm dilatato, stigmate terminali brevissime 5-lobato.

HAB. Liukiu: Nakanoshima, (No. 96), Aug. 1910.

Differs from the type by the obovate or shortly oblong leaves.

Rhododendron indicum SWEET var. **formosanum** HAYATA n. v. Rami pilis squamiformibus dense obteeti. Folia oblonga ovata rotundato-ovata chartacea $2\frac{1}{2}$ cm. longa 2 cm. lata supra molle tenuiter parce adpresso hirsuta, subtus pilis longiuseulis adpressis parce obtecta, apice obtusa ad summum obtuse apiculata basi acuta, (venis primariis lateralibus utroque latere costae 3-4 areuato-flexuosis cum venis proximis superioribus areolam formantibus), subtus ad costas dense pilosa. Flores 3-4 ad apicem ramulorum fasciculatim quasi-terminales, pedicellis 1 em. longis dense pilosis. Calyx 5-lobatus, lobis elongatis oblongis obtusis 3 mm. longis $1\frac{1}{3}$ mm. latis margine longe ciliatis intus glabris extus dense pilosis. Corolla late campanulata 3 em. longa 5-lobata, lobis oblongis apice rotundatis, tubo deorsum breve hirsuto. Stamina 10, inaequalia, filamentis deorsum hirsutis, antheris oblongo-linearibus 2 mm. longis $\frac{2}{3}$ mm. latis apice truncatis 2-porosis basi emarginatis. Ovarium 2 mm. longum, stylo glabro 3 em. longo apice leviter dilato, stigmate terminali.

HAB. Kusukusu, leg. C. OWATARI, Mart. 1898.

Rhododendron (*Choniastrum*) lamprophyllum HAYATA sp. nov. Rami glabri vel tenuissime pubescentes. Folia versus apicem ramorum congesta glaberrima supra nitida chartacea vel chartaceo-membranacea oblongo-lanceolata 6½ em. longa 2 em. lata apice cuneato-acuta ad summum obtusa ad centrum summorum mueronibus circ. 1 mm. longis obtusis instructa, basi acuta vel obtuso-acuta, (supra costis et venis lateralibus tenuiter elevatis costis supra brevissime pubescentibus, subtus costis prominente elevatis venis tenuissimis venulis reticulatis, supra impresso-reticulatis vel non vissis), petiolis 1½-2 cm. longis supra angustissime canaliculatis tenuissime pubescentibus vel glabris. Flores ad axillas foliorum superiorum solitarii, bracteis vel perulis basi pedicellorum sitis, perulis extimis brevissimis late ovatis 1½ mm. longis 2 mm. latis, intimis longissimis 9 mm. longis late ovatis 7 mm. latis margine ciliolatis utraque pagina glabris ad insertionem 2 mm. latis, bracteolis spathulato-linearibus 3 mm. longis ½ mm. latis ciliolatis. Pedicelli 1-1½ em. longi glanduloso-hirsuti. Calyx fructifer campanulatus glanduloso-hirsutus alte 5-lobatus, lobis rectangulari-oblongis vel linearibus 7-8 mm. longis 3½ mm. latis basi extus deorsum glandulosohirsutis medio sursum glabris intus toto glabris margine approximativi ciliolatis, (ciliolis crassis) apice obtusis. Capsula ovoido-ellipsoidea 8 mm. longa 5½ mm. lata pilis glandulosis validiusculis obtecta. Semina minuta angulato-columnaria obliqua, (angulis prominentibus), utrinque obtusa 1 mm. longa ¼ mm. lata nigricantia longitudinaliter minute sub microscopio striato-reticulata utrinque rubescens.

HAB. Randaisan, leg. B. HAYATA et U. MORI, 1908, Aug. Fr.

Rhododendron lasiostylum HAYATA sp. nov. Rami et ramuli pilis fulvescentibus squamiformibus dense obtecti, pilis 1½ mm. longis ½ mm. latis. Folia chartacea oblonga vel oblongo-lanceolata 33 mm. longa 12 mm. lata apice acuta ad summum apiculata basi acuta supra sebro-pilosa, (pilis brevibus adpressis basi tumidis) subtus adpresso-pilosa ad costas prominentes dense adpresseque pilosa (pilis squamiformibus lanceolatis 2 mm. longis), venulis minute reticulatis, petiolis 8 mm. longis pilis dense adpressis obtectis. Flores ad apicem ramulorum terminales 2-3-aggregati, pedicellis 5 mm. longis pilis squamiformibus albicantibus dense obtectis. Calyx 5-lobatus, lobis elongato-

oblongo-ovatis 3 mm. longis 1 mm. latis margine longe denseque ciliatis intus glabris extus pilosissimis. Corolla campanulata $1\frac{1}{2}$ mm. longa 5-lobata, lobis inaequalibus circ. 1 cm. longis oblongis apice obtuso-rotundatis. Stamina 10, longitudine inaequalia circ. $1\frac{1}{2}$ cm. longa, filamentis complanatis a basi usque ad supra medium brevissime hirsutis, antheris oblongis $1\frac{1}{2}$ mm. longis apice truncato-emarginatis basi obtusis obscure apiculatis. Ovarium ovoido-conicum 2 mm. longum pilis albicantibus dense obtectum, stylo declinato filiformi 14 mm. longo a basi usque ad medium piloso sursum glabro, stigmate \pm dilatato. Capsula lignosa cylindrica 8 mm. longa, valvis 8 mm. longis $1\frac{1}{2}$ mm. latis dorso strigilloso-pilosis.

HAB. Monte Randaisan, leg. U. MORT, Juni., 1911.

Rhododendron (*Choniastrum*) **leiopodum** HAYATA sp. nov. (Tab. XXIV.) Ramuli gracilisculi recti ternatim ramosi cinerascentes. Folia versus apicem ramlorum approximativim disposita coriacea elliptico-lanceolata vel ob-lanceolata usque ad 10 cm. longa $2\frac{1}{2}$ cm. lata sursum medio latissima apice breve acuminata basi cuneata vel cuneato-acuta margine revoluta supra in exsiccato viridia subtus pallidiora, supra costis et venis impressis, venis venulis impresso-reticulatis, subtus costis prominentibus venis lateralibus tenuissime elevatis vix conspicuis, utrinque glabra, petiolis $1\frac{1}{2}$ cm. longis supra angustissime sulcatis apice angustissime alatis facie fuscentibus. Flores circa gemmam terminalem ad axillas foliorum quasi-verticillatorum summorum verticillatim siti, ad axillam folii singuli solitarii, floribus singulis perulis multis involucratis, perulis multis, extimis minimis late ovatis 3 mm. longis, interioribus majoribus, intimis longissimis spathulatis 3 cm. longis pedicellum 2-plo superantibus apice obtusis obtuso-rotundatis margine dense ciliolatis supra medio usque ad basin abrupte angustatis, partibus angustatis 18 mm. longis 3 mm. latis extus tenuiter pubescentibus intus glabris, bracteolis spathulatis angustissime linearibus 3 cm. longis sursum 3 mm. latis basi 1 mm. latis margine dense ciliatis extus tenuiter pubescentibus intus glabris, pedicellis 2 cm. longis vel brevioribus glabris. Calyx minor brevissimus 4 mm. in diametro 5-dentatus, dentibus late triangularibus obtusis 2 mm. latis $\frac{1}{2}$ mm. longis glaberrimis. Corolla campanulato-hypocrateriformis usque

ad 6 cm. longa, tubo 2½ cm. longo deorsum angustato intus supra basin usque ad infra medium tenuiter hirsuto, limbo 5-lobato, lobo superiore 3½ cm. longo 2½ cm. lato oblongo apice rotundato prope basin purpureo-punctato, lobis altris vix minoribus. Stamina 8, in longitudine inaequalia, filamentis complanatis prope basin tenuiter hirsutis basin glabris, a infra medium usque ad apicem glabris, antheris ellipsoideis 3 mm. longis 1½ mm. latis apice truncatis lobatis 2-porosis basi emarginatis. Ovarium cylindricum 1 cm. longum 2½ mm. latum glabrum leviter 5-suleatum, stylo glabro 5 cm. longo apice vix dilatato, stigmate brevissime 5-lobato.

HAB. Shichiseitonsan, leg. S. SASAKI, 1911, Aprili. Fl.

The present plant is more or less related to *R. Henryi*, *R. Simiarum* and *R. ellipticum*, but differs from the first by the glabrous leaves, from the second by the glabrous peduncles and shortly acuminate glabrous leaves, and from the last in the pallid under surface of the leaves.

Rhododendron (Choniastrum) leptosanthum HAYATA sp. nov. *Rhododendron ellipticum* HAYATA Fl. Mont. Formos. p. 152, pro parte, (non MAXIM). Rami ± flexuosi cinerascentes. Folia versus apicem rami disposita ovato-vel obovato-oblonga 5-6 cm. longa 2-2½ cm. lata utroque acuta apice acutissima basi acuta, (costa supra impressa subtus prominenti venis utraque facie tenuiter elevatis vix conspicuis) supra nitida subtus opaca pallidiora margine integerrima tenuissime recurva vel plana utraque glabra, petiolis brevioribus in longitudine ¼-plo laminam aequantibus glabris supra angustissime sulcatis apice angustissime alatis. Flores quasi-terminaliter 5-6-fasciculati, (in sensu stricto circa gemmam ad axillas foliorum summorum quasiverticillatorum verticillatim 5-6 siti), perulis deciduis non visis, pedicellis glabris 1½ cm. longis. Calyx brevissimus 2½ mm. in diametro brevissime 5-dentatus, dentibus glabris brevissimis ½ mm. longis obtusissimis. Corolla late campanulata 3 cm. longa, tubo brevi 1 em. longo, limbo 5-lobato, lobis patentibus 2 em. longis obovato-oblongis apice rotundatis intus supra basin usque ad infra medium tenuiter hirsutis. Stamina 10 in longitudine inaequalia, filamentis supra basin usque ad infra medium hirsutis basin glabris, infra medium usque ad apicem glabris, antheris ovato-oblongis 2 mm. longis apice truncatis basi

emarginatis non apiculatis. Ovarium cylindricum 5 mm. longum $1\frac{1}{2}$ mm. latum glaberum tenuiter 5-sulcatum, stylo $2\frac{1}{2}$ em. longo glaberrimo apice vix dilato, stigmate brevissime 5-lobato.

Наб. In montibus prope Akō, ad 5000 ped. alt., leg. T. KAWAKAMI, 1907.

Differs from *R. leiopodum* by the much smaller flowers and ovato-oblong leaves; and from *R. ellipticum* in its pale lower surface of the leaves.

Rhododendron longiperulatum HAYATA sp. nov. Rami et ramuli ternatim ramosi divaricati pilis squamiformibus adpressis atro-castaneis dense obtecti. Folia chartacea oblonga 23 mm. longa 11 mm. lata in exsiccato flavescens apice acuta ad summum apiculata supra seabo-pilosa (pilis albicantibus basi tumidis patentibus) infra parcissime pilosa, ad costas dense ad venulas parce adpresso-pilosa (pilis castaneis adpressis), supra costis venis et venulis impressis, venulis impresso-reticulatis, subtus costis et venis leviter elevatis venulis impressis reticulatis, venis primariis lateralibus utroque latere costæ 3-4 leviter arenatis, petiolis brevissimis 2 mm. longis semi-teretibus, pilis linearibus 3-4 mm. longis obtectis. Folia sub fasciculo florum variabilia spathulata basi dilata gradatim ad perulam abeuntia. Flores terminales 2-3-fasciculati, fasciculo in alabastro perulis imbricatis suffulto, perulis extimis minoribus ovatis brevioribus acutis, interioribus longioribus, intimis (vel bracteis sub flore) longissimis angustato-oblongis 18 mm. longis 5 mm. longis apice acutis, omnibus intus glabris extus dorso sursum ferrugineo-pilosis deorsum glabris. Flores 1-bracteati et 2-bracteolati, bracteolis linearibus 11 mm. longis $\frac{1}{10}$ vel $\frac{1}{20}$ mm. latis intus glabris extus pilosissimis, pedicellis 4-5 mm. longis longe pilosissimis. Calyx 5-lobatus, lobis triangulari-ovatis $2\frac{1}{2}$ mm. longis $1\frac{1}{2}$ mm. latis intus glabris extus longe denseque pilosis, pilis 3 mm. longis. Corolla campanulata 3 em. longa 5-lobata, lobis oblongis 1 cm. longis apice rotundatis basi leviter contractis. Stamina 10 in longitudine inæqualia, filamentis complanatis deorsum hirsutis sursum glabris, antheris elongato-oblongis $1\frac{1}{2}$ mm. longis $\frac{2}{3}$ mm. latis apice truncatis 2-porosis basi leviter emarginatis non apiculatis, loculis anterioribus brevioribus quam iis posterioribus. Ovarium cylindrico-ovoideum $1\frac{1}{2}$ mm. longum pilis longissimis $2\frac{1}{2}$ mm. longis dense obtectum, stylo glaberrimo cum

ovario articulato 3 cm. longo, stigmate terminali \pm dilatato. Capsula breve cylindrica 7 mm. longa extus hirsuta.

HAB. Mt. Daiton, leg. Y. SHIMADA, Aug. 1910.

Rhododendron Morii HAYATA Mater. Fl. Formos. p. 173. Descriptio auctata: Folia in exsiccato supra venis et venulis elevato-reticulatis, areolis intra reticulum impressis. Fores 5-6, terminale ad apicem ramorum fasciulati, pedieillis 2 cm. longis brevissime glanduloso-hirsutis. Calyx subplanus brevissimus 5 mm. in diametro breve 5-lobatus, lobis brevissimis late rotundatis margine glanduloso-ciliolatis (ciliolis brevissimis obtusis) utraque glabris. Corolla late campanulata a basi usque ad apicem gradatim ampliata 4½ cm. longa 5 cm. in diametro 5-lobata, lobis 2 cm. longis late rotundatis apice rotundatis vel tenuiter emarginatis, tubo intus latere superiore punctato-maculato, areolis punctatis obovatis 3 cm. longis 2½ cm. latis. Stamina 10, filamentis in longitudine inaequalibus basi \pm dilatis, partibus dilatis 8 mm. longis 1 mm. latis brevissime denseque hirsutis (pilis ferrugineis), partibus non dilatatis glabris, antheris ellipsoideis 3½ mm. longis apice truncatis basi lobato-emarginatis. Ovarium cylindricum 8 mm. longum 3½ mm. latum, pilis glandulosis brevissimis dense obtectum tenuiter 5-sulcatum, stylo 3½ em. longo prope basin glanduloso-hirsuto cæterum glaberrimo apice dilatato, stigmate terminali.

HAB. Randaisan, 1908, leg. U. MORI, (No. 3514).

Rhododendron (Azaleastrum) ovatum PLANCH. ex MAXIM. Rhod. As. Or. p. 45; FORBES et HEMSL. Ind. Fl. Sin. II. p. 28.

Azalea ovata LINDL; HOOK. Bot. Mag. t. 5064; BENTH. Fl. Hongk. p. 201.

OBSERV. Rami cinerascentes subglabri vel brevissime pubescentes, cicatricibus foliorum obtriangulari-rotundatis. Folia chartacea vel tenuiter coriacea versus apicem ramorum approximativi disposita ovata vel ovato-oblonga 4½ cm. longa 2 cm. lata apice cuneato-acuta ad summum obtusa ad centrum summorum mucronibus brevissimis instructa, basi rotundata vel obtusa utraque opaca et glabra subtus pallidiora, supra ad costas brevissime pubescentia, costis et venis supra elevatis elevato-reticulatis, subtus costis elevatis venis

non elevatis planis, venis lateralibus primariis inconspicuis, petiolis 7 mm. longis angustissime alatis supra angustissime sulcatis dense brevissimeque pubescentibus. Flores ad axillas foliorum superiorum solitarii perulis multiseriatis instructi, perulis extimis minutis triangularibus, intimis longissimis obovatis 1 cm. longis 8 mm. latis apice obtusis vel rotundatis basi deorsum angustatis ad insertionem $1\frac{1}{2}$ mm. latis margine revolutis minute ciliolatis (ciliolis minutissimis brevissimis obtusis) intus glabris extus brevissime pubescentibus, bracteolis filiformibus minimis 1 mm. longis, pedicellis $1\frac{1}{2}$ mm. longis brevissime pubescentibus pilis glandulosis parce hæc atque illæ dispersis. Calyx late campanulatus alte 5-lobatus extus basi pilis setulosis dense obtectus, lobis ovatis 5 mm. longis 4 mm. latis apice rotundatis membranaceis margine ciliolatis (ciliolis obtusis brevissimis \pm glandulosis) extus basi pilis setulosis dispersis, cæterum brevissime pubescentibus vel glabris, intus glaberrimis. Corolla late campanulata $2\frac{1}{2}$ cm. longa 4 cm. in diametro alte 5-lobata, (lobis rotundatis 2 cm. longis), prope basin lobi superioris purpureo-punctato-maculata, tubo intus brevissime pubescenti. Stamina 5 in longitudine inaequalia, filamentis medio deorsum hirsutis sursum glabris complanatis, antheris oblongis 3 mm. longis $1\frac{1}{2}$ mm. latis apice truncatis 2-porosis lobatis basi obtusis interdum obseure apice latis. Ovarium latissime conicum $3\frac{1}{2}$ mm. latum 2 mm. longum basi annulariter glabrum (partibus glabris mellem exsudentibus) supra basin usque ad apicem setulis obtusis brevibus dense obtectum, stylo $2\frac{1}{2}$ cm. longo deorsum tenuissime pubescenti vel subglabro, medio sursum glaberrimo apice haud dilatato, stigmate terminali.

HAB. Fokien: Isan, leg. S. NAGASAWA, 1910, Aprili. (No. 220).

The type I have never seen; description given in BENTH. Fl. Hongk. p. 201, exactly accords with our plant.

Rhododendron (*Eurhododendron*) **pachysanthum** HAYATA. Rami et ramuli validi primum tomentosi demum glabri, cicatricibus foliorum late triangularibus. Folia ad apicem ramorum approximativis sita elongato-oblonga 8-9 cm. longa $3\frac{1}{2}$ cm. lata ad medium latissima apice acutissima basi rotundata vel obtusa obtuso-rotundata supra glabra basi albo-ferrugineo-tomentosa, (pilis stellatis dense obtectis) demum glabra coriacea, supra costis

angustissime sulcatis subtus prominentibus, venis utraque page vix conspicuus, supra sub microscopio minute reticulata, areolis intra reticulum elevatis, venis lateralibus primariis tenuissimis supra tenuiter impressis rectis subtus tenuissime elevatis, petiolis $1\frac{1}{2}$ cm. longis supra sulcatis tomentosis. Gemma foliorum ovoido-cylindrica 3 cm. longa 7 mm. lata, perulis inferioribus cuspidiformibus, superioribus elongatis acutis. Flores ad apicem ramorum 10–20-fasciculati (sed in sensu stricto in racemis brevissimis, rhachidibus 1–2 cm. longis multo brevioribus quam pedicellis) perulis multis involuclati, perulis extimis minutis late triangularibus longe cuspidatis 3 mm. latis, mediocribus majoribus rotundatis 2 cm. longis apice obtusis valde concavis, intimis (vel bracteis) spathulatis 3 cm. longis sursum 1 cm. latis deorsum angustatis attenuatis basi 2 mm. latis sursum latissimis alabastrum florum amplectantibus apice emarginatis ad centrum breve cuspidatis extus dense intus laxe sericeo-hirsutis, bracteolis filiformi-linearibus 1 cm. longis pubescentibus, pedicellis $2\frac{1}{2}$ cm. longis glanduloso-pubescentibus. Calyx brevissimus late 5-dentato-lobatus, lobis late triangularibus acutis margine glanduloso-ciliolatis (ciliolis brevissimis obtusis) extus basin glanduloso-hirsutis. Corolla late campanulata 4 cm. longa totiusque in diametro, tubo late campanulato 2 cm. longo latere dense maculato-punctato, (parte superiore tubi punetata obovata $1\frac{1}{2}$ cm. longa 8 mm. lata), limbo 5-lobato, lobis tubum in longitudine aequantibus rotundatis apice ± emarginatis utrinque glabris. Stamina 10, filamentis in longitudine inaequalibus basi dilatatis, partibus dilatatis 4 mm. longis hirsutis cæterum glabris, antheris ellipsoideis apice truncatis basi obtusis emarginatis non apiculatis. Ovarium cylindricum 5 mm. longum 2 mm. latum pilis brevissimis glandulosis dense obtectum, stylo toto glabro $2\frac{1}{2}$ cm. longo apice vix dilatato, stigmate terminali brevissime 5–6-lobato. Capsula dense pilis brevissimis obtecta cylindrica $1\frac{1}{2}$ cm. longa $\frac{1}{2}$ cm. lata.

HAB. In montibus centralibus, leg. U. MORI, 1911, Aprili. Fl.

Near *R. Morii* HAYATA; but differs from it by the quite glabrous style, and in its leaves which are densely tomentose beneath, and are so impressively reticulated on the upper surface that intra-reticular areoles are elevated.

Rhododendron (*Eurholodendron*) **rubropunctatum** HAYATA sp. nov.

Frutex; rami validissimi, cortice cinerascenti subglabro. Folia versus apicem ramorum approximativi disposita coriacea usque ad 11 cm. longa 3½ cm. lata elongato-oblonga vel oblanceolata a medio sursum latissima apice obtuso-acuta ad summum breve crasso-apiculata basi obtusa utrinque glabra supra in exsiccato opaca subtus flavo-pallida, sub microscopio minute rubropunctata margine integra desuper recurva, (supra costis impressis, venis primariis tenuissimis impressis vix conspicuis, subtus costis prominentibus, venis primariis lateralibus tenuissime elevatis) utraque glabra, petiolis usque ad 3 cm. longis rugosis subglabris fuscentibus apice latere brevissime subalatis supra angustissime sulcatis. Gemma foliorum ovato-cylindrica 4 cm. longa 8 mm. lata multiseriatim perulata, perulis extimis brevissimis cuspidatis, intimis longissimis oblongis 4 cm. longis. Flores breve racemosi vel fasciculati, racemis terminalibus, rhachidibus 2 cm. longis, longe pedicellatis, pedicellis 4 cm. longis caducissime pubescentibus, perulis multiseriatis extimis minutis late rotundatis glabris, intimis longissimis angustatis 4 cm. longis 8 mm. latis obtusis utraque facie molle denseque sericeo-pubescentibus, bracteis filiformibus hirsutis 1 cm. longis. Corolla late campanulata circ. 5 cm. longa 5-lobata, lobis oblongo-rotundatis 2 cm. longis apice rotundatis vel emarginatis, tubo utraque glabro medio latere superiore purpureo-punctato. Stamina 10, in longitudine inæqualia, filamentis basi ± dilatatis, partibus dilatis 6 mm. longis brevissime denseque hirsutis, cæterum glabris, antheris oblongo-cuneiformibus 4 mm. longis 1 mm. latis apice truncatis 2-porosis lobatis basi angustatis lobatis vel emarginatis hand apiculatis. Ovarium ovoideo-conicum 6 mm. longum 4½ mm. latum 5-sulcatum dense hirsutum, stylo 4 cm. longo vix exerto a medio deorsum hirsuto sursum glabro apice dilatato, stigmate terminali brevissime lobulato.

HAB. Mt. Shichiseitonzan, leg. S. SASAKI, Aprili. 1910.

Pyrola LINN.

Pyrola alboreticulata HAYATA sp. nov. (Tab. XXV.) Suffrutex humilis, caules ascendentes cum racemis 15-20 cm. longi, basi foliosi, partibus foliosis 7-5 cm. longis, inter folios squamatis, squamis linearibus acutis circ. 1 cm. longis, a supra basi sursum aphylli supra medium bracteis 1

vel 2 instructi, versus apicem flores 2-3 gerentes. Folia alterna approximata vel remota glabra tenuiter coriacea ovata vel oblonga 3-4 cm. longa $1\frac{2}{3}$ -3 cm. lata apice acuta ad summum minute calloso-mucronata basi rotundata subito ad extremitatem acuta ad petiolum attenuata, aequalia interdum obliqua, margine integra sed remote mucronibus minutis instructa (mucronibus a se circ. 5 mm. remotis) tenuiter marginata vel leviter angustissime recurvata supra in vivo fusco-viridia, ad nervos et venas albo-reticulata, subtus pallidissima, nervis venisque utraque pagine tenuissime elevatis, venis primariis lateralibus utroque latere costæ 4-3 angulo 80° a costa divaricatis sursum arcuatis eas superiorem proximam attingentibus areolas utroque latere costæ 3-4 formantibus, petiolis 3-4 cm. longis laminam in longitudine 2-plo superantibus vel paullo longioribus complanatis supra sulcatis. Racemi 3-4-florati, floribus 1 cm. a se remotis, pedunculis (vel partibus caulis aphyllis) circ. 10 cm. longis 1 mm. in diametro sectionis subangulatis ad angulis subalatis glabris medio 1-bracteatis. Flores declinati apertentes 15-18 mm. in diametro breve pedicellati, pedicellis 4 mm. longis, sub pedicellis singulis 1-bracteati, bracteis linearibus acutis. Sepala 5 (vel lobi calycis) basi \pm connata oblongo-angustata 5-6 mm. longa $2\frac{1}{2}$ mm. lata apice obtusa sursum obscure denticulata vel integra deorsum integra obscure 3-5 nervia basi latissima. Petala 5 obovato-rotundata $7\frac{1}{2}$ -7 mm. longa 6 mm. lata versus marginem tenuissima 3-4-nervia apice rotundata basi ad insertionem 2 mm. lata margine integra. Stamina 10, per paria petalis opposita, filamentis complanatis 6-7 mm. longis basi circ. $\frac{3}{4}$ mm. latis introrse \pm recurvatis 1-costatis, antheris retroflexis oblongis apice (ut videntur) dorso cum filamentis affixis apice extrorse leviter recurvis 2-lobatis, loculis apice in tubum $\frac{1}{2}$ mm. longum productis introrse 1-porosis apice truncatis basi apiculatis latere profunde 1-sulcatis. Ovarium depresso-globosum $3\frac{1}{2}$ mm. in diametro aequans apice impressum, stylo declinato columnari 8-9 mm. longo apice \pm dilatato, stigmate 5 lobato, lobis teretibus. Capsula depresso-globosa apice profunde impressa in sectione verticali obcordata 7-8 mm. in diametro 5 mm. longa 5-lobata loculicide dehiscens. Semina numerosa utroque producta, cum alis linearibus 1 mm. longa $1\frac{1}{6}$ mm. lata ntrinque truncata.

HAB. Arisan, leg. B. HAYATA et S. SASAKI, Jan. 1912; ad sumnum Bataiankei, leg. MORI, Juni. 1912.

Near *P. rotundifolia* LINN.; but distinguishable from it by the ovate acute leaves with much fewer lateral veins along which the leaves are white reticulated. There is a species called *P. atropurpurea* FRANCHET (Journal de Botanique IX. p. 372) which I could not examine. It may presumably be different from our plant.

Pyrola morrisonensis HAYATA (Tab. XXVI.) Fl. Mont. Formos. p. 155; *Pyrola elliptica* NUTT. var. *morrisonensis* HAYATA in Tokyo Bot. Mag. XX. p. 18. Suffrutex humilis 20-30 cm. alta, caulibus repentibus ascendentibus glabris rubro-fuscentibus tereto-angularibus eramosis basi foliosis apice scapiformibus, partibus foliosis inferioribus 3-4 cm. longis. Folia basi caulis sita alterna vel subopposita vel subradicalia longe petiolata ovato-rotundata vel ovato-rhomboidea apice rotundata obtusa acuta vel emarginata basi rotundata vel late truncata ad apicem petiolorum subito breve acuta 2-3 cm. longa 2-2½ cm. lata margine crenulato-serrulata ad sinus serrularum minute calloso-mucronata glabra chartacea, (costis utrinque tenuiter elevatis, venis et venulis supra distinete impressis reticulatis, subitus tenuiter elevatis reticulatis), petiolis longis gracilibus laminam in longitudine triplo superantibus 5-6 cm. longis complanatis supra ± sulcatis basi leviter dilatis glabris. Racemi (vel caules floriferi) 10-25 cm. longi basi foliati supra partem foliosam squamati (squamis alteris inferioribus oppositis superioribus remotis glabris angustatis vel obovato-angustatis 8-10 mm. longis 5 mm. latis 1-nerviis sublyalinis, venis lateralibus tenuissimis apice acutis subobliquis basi aequilateralibus rachidem subamplectantibus) supra medium sursum usque ad partem floriferam nudi, partibus florigeris 8-5 cm. longis, floribus remotis 1-2 cm. a se remotis sub singulis 1-bracteatis, bracteis oblongo-angustatis 8 mm. longis 3 mm. latis basi aequilateralibus apice acutis, pedicellis 7-8 mm. longis recurvato-descendentibus vel patentibus glabris apice vix dilatatis ad calycem abeuntibus. Flores ± cernui apertientes 1½ cm. in diametro. Sepala 5 basi leviter connata ovata apice obtusa vel acuta basi latissima 2½ mm. longa 2 mm. lata apice obscure serrata sursum deorsum integra

1-costata vel 1-nervia, utroque latere nervi 1-venulis parallelis tenuissimis instructa. Petala 5 patentia concava rotundato-oblonga apice rotundata basi obtusa 7-6 mm. longa 5-6 mm. lata basi ad insertionem 2 mm. lata glabra margine obscure denticulata 3-nervia vel obscure 5-nervia, nervis subrectis, venis lateralibus utroque latere patentibus tenuibus paullo-ramosis. Stamina 10, per paria cum petalis opposita, filamentis basi recurvis 7-6 mm. longis complanatis $\frac{1}{3}$ - $\frac{1}{2}$ mm. latis 1-costatis apice brevissime subfureatis glabris supra basin dilatis circ. $\frac{2}{3}$ mm. latis, antheris introrse retroflexis quasi-pendulis apice (ut videntur) dorso cum filamentis affixis angustato-ellipsoideis 2 $\frac{3}{4}$ mm. longis 1 mm. latis apice 2-lobatis basi brevissime 2-apiculatis, loculis 2 latere profunde 1-sulcatis apice gradatim in tubum $\frac{1}{3}$ mm. longum productis apice introrse 1-porosis basi apiculatis. Ovarium glabrum depresso-globosum 3 mm. in diametro 2 mm. longum 5-lobatum apice depresso (obcordatum in sectione verticali) 5-loculare, loculis multi-ovulatis, stylo declinato versus apicem ascendi columnari 8-9 mm. longo apice \pm clavato-dilatato vel campanulato-dilato apice 1 $\frac{1}{2}$ mm. in diametro, stigmate in partem campanulatam apicis styli leviter exerto 5-lobato lobis, teretibus. Capsula depresso-globosa 5 mm. in diametro 3 mm. longa 5-lobata loculicide dehiscentia apice profunde impressa (in sectione verticali profunde obcordata), placantis spongiosis axe persistenti affixis, polysperma. Semina minuta, testa utrinque producta truncata reticulata cellulari; albumine carnosum.

HAB. Ad summum Bataiankei, leg. U. MORI, Juni. 1912.

As original description is based on an imperfect specimen which lacks flowers, I have taken this occasion to give the full description of this species basing it upon a perfect specimen.

Chimaphila PURSH.

Chimaphila japonica MIQ.; MATSUM. Ind. Pl. Jap. II.-2 p. 448.

HAB. In Monte centrali, ad 10000 ped. alt., leg. U. MORI, Dec. 1908.

No flowers; as far as is concerned fruits and general appearance, it is referable to this Japanese species.

Monotropeæ.

Monotropa LINN.

Monotropa uniflora LINN.; FORES et HEMSL. Ind. Fl. Sin. II. p. 34.

HAB. Arisan, leg. S. SASAKI, Mart. 1911.

DISTRIB. Northern India, Central China, Mandshuria, Japan and North America.

Diapensiaceæ.

Shortia TORR. et GR.

Shortia (Sect. *Exappendiculata*) **exappendiculata** HAYATA n. sp. (Tab. XXVII.) Rhizoma ascendens vel repens lignosum teres 4 mm. in diametro sectionis, radices fibrosas longissimas emittens, apice approximativum foliosum, ad apicem scapos solitarios vel 2-3 cæspitosos gerens. Folia omnia radicalia 10-20 patentissima ad terram attingentia longe petiolata fere rotundata maxima 5 cm. in diametro apice late truncata basi rotundata ad extremitatem subito acuto-attenuata ad petiolum abeuntia chartacea margine serrato-crenata, (crenis obtusis sed ad apicem minute mueronatis), ultraque page glabra, (supra costis venis et venulis distincte elevatis, venis lateralibus primariis utroque latere costæ 3, ramis venarum primiarum ad muernones crenarum attingentibus, subtus costis prominente sed venis primariis et venulis obscure elevatis, vel non elevatis), petiolis usque ad 7 cm. longis sursum complanatis (dorso compressis) subalatis sed a medio deorsum a latere compressis facie angustissime sulcatis. Scapi ad apicem rhizomatum solitarii vel 2-3-fasciculati erecti 5 cm. longi (fructiferi 15 cm. longi vel longiores) glabri teretes prope apicem 2-4-bracteati, basi perulis 6-7 involuerati, perulis interdum linearibus vel ovatis obtusis vel acutis circ. 7 mm. longis crassiuseulis, bracteis versus apicem vel infra florem 3-4 longe triangularibus vel late euspidatis 4½ mm. longis 3½ mm. latis. Sepala 5 ovata 6 mm. longa

4 mm. lata apice acuta basi leviter contracta 2 mm. lata valde imbricata 7-nervia glabra. Corolla late campanulata 8 mm. longa leviter 5-loba, lobis brevibus 3 mm. longis 5 mm. latis rectangularibus apice late truncatis vel rotundatis altiuscule crenulatis, venis lateralibus utroque latere 3, utraque facie glabra. Stamina 5, lobis corollæ alterna, antheris sessilibus ad medium inter sinus et basin corollæ sitis cordato-reniformibus apice emarginatis basi cordatis 1 mm. longis $1\frac{1}{2}$ mm. latis. Staminodia 0. Ovarium globosum glabrum 2 mm. in diametro, stylo 4 mm. longo simplici, stigmate terminali non lobato. Calyx fructifer \pm accrescens, sepalis late ovato-triangularibus 5 mm. longis basi latissimis 3-4 mm. latis. Capsula ovoidea 5 mm. longa, sepalis inclusa, loculicide dehiscens, valvis a columna solutis, columna centrali crassa. Semina angulato-fusiformia \pm obliqua 1 mm. longa atro-rubra minute reticulata.

HAB. Rakuraku, leg. G. NAKAHARA, Aug. 1905; Mt. Musha, ad 7000 ped. alt., leg. U. MORI (No. 1153); Randaisan, leg. U. MORI, Aug. 1908.

Differs from all the known species of the genus by the sessile anthers, not divided styles of the capsules, and by the absence of the staminodes. It may constitute a new genus *Shortiopsis* (I should propose to call it) on account of the characters just mentioned.

Shortia subcordata HAYATA sp. nov. Ut plantæ præcedentis, sed folia rotundata, 4 cm. in diametro, margine crenata, ad summum crenarum mucronata, basi rotundata vel cordata. Flores minores.

HAB. Shintiku: Kareizan, leg. U. MORI, 1906, Juni., (No. 1422.)

Differs from the preceding plant by the round- or cordate-based leaves.

Shortia transalpina HAYATA sp. nov. Rhizomata erecto-ascendentia basi radices tenues fibrosas emittentia, apice 2-3 ramosa, ramis simplicibus folios et scapum gerentibus. Folia omnia radicalia 5-6 ad apicem rhizomatum sita rotundato-spathulata vel rotundato-ovata longe petiolata; laminæ obovato-spatulatae vel obovatæ 2 cm. longæ $1\frac{1}{2}$ cm. latæ apice perfecte rotundatae basi subito attenuatae gradatim ad petiolum abeuntes utraque glabrae, costis et venis utraque pagine vix conspicuis vel tenuissime elevatis,

venis lateralibus primariis utroque latere 2-3, margine subintegre sursum utroque latere crenis 3 instructæ (crenis brevissimis vel obseuris) ad sinus inter crenas mucronibus instructæ, petiolis $2\frac{1}{2}$ mm. longis sursum angustissime alatis supra sulcatis basi \pm dilatatis. Flores ignoti. Scapi fructiferi ad apicem ramorum rhizomatum solitarii vel 2-3-fusciculati erexit 7 cm. longi aphylli uniflorati versus apicem 3-4-bracteati basi perulis 2 instructi, perulis lineari-ovatis 6 mm. longis apice obtusis, bracteis ovatis vel triangulari-cuspidatis 4 mm. longis. Sepala fructifera \pm accrescentia exteriora ovata 6 mm. longa apice obtusa interiora angustiora 6-7 mm. longa 2 mm. lata circ. 10-nervia apice obtusa. Capsula ovoidea 3 mm. longa, stylo simplici, stigmate capitato leviter 3-lobato, lobis globosis facie muricatis. Semina oblique globoso-ovoidea $\frac{1}{2}$ mm. longa fusco-rubra reticulata, reticulis hexagonis.

HAB. Montibus centralibus 10000 ped. alt., leg. U. MORI, Dec. 1908.

Differs from other species of the genus in its very small form. Here is another species which I could not examine. It is *Shortia thibetica* FRANCH. N. Arch. m. H. N. Paris 2 sér. X. 54.

Primulaceæ.

Stimpsonia WRIGHT.

***Stimpsonia chamædryoides* WRIGHT**; FORBES et HEMSL. Ind. Fl. Sin. II. p. 46.

HAB. Formosa: Loco non indicato. (Taihoku Museum).

DISTRIB. China, Corea and Lüehū.

Primula LINN.

***Primula Miyabeana* ITO et KAWAK.** in Coll. Bot. Pap. Miyabe (1911) p. 1.

HAB. Mt. Morrison, 12000 ped. alt.

Myrsineæ.

Mæsa FORSK.**Mæsa formosana** MEZ. in Pfl.-reich. p. 29.

HAB. Formosa et Liuksiu.

Myrsine LINN.

Myrsine microphylla HAYATA sp. nov. Rami graciles subcinerascentes, ramiculis gracillimis angulatis, ad angulos subalatis, facie inter alas minute hirsutis. Folia obovata vel cuneato-obovata usque ad $1\frac{1}{2}$ cm. longa 7–8 mm. lata apice acuta ad summum mucronata basi cuneata ad petiolum attenuata margine a infra medium usque ad apicem aristato-serrulata, (serrulis utroque latere 4–7 a se circ. 2 mm. remotis ascendentibus incurvis $\frac{1}{3}$ mm. longis), a infra medium usque ad basin integra, utraque pagine glabra subtus pallidiora supra ad costas breve hirsuta, costis et venis venulisque utraque pagine elevatis, subtus in exsiccato nigro-punctata vel non punctata, petiolis 1 mm. longis supra planis hirsutis subtus glabris. Flores 5–6-fasciculati, fasciculis sessilibus ad axillas foliorum superiorum, basi perulatis, perulis oblongis apice obtusis $\frac{1}{2}$ mm. longis margine ciliolatis, pedicellis brevibus $1\frac{1}{2}$ mm. longis. Calyx-tubus brevissimus $\frac{1}{10}$ mm. longus 4–(vel 5?) lobatus, lobis angusto-oblongis $\frac{1}{3}$ mm. longis apice obtusis margine ciliolatis erassiusculis utraque pagine rubro-punctatis, punctis 3–4. Corolla subcampanulata $1\frac{1}{2}$ mm. longa, tubo $\frac{1}{3}$ mm. longo, lobis 4 angustato-oblongis $\frac{2}{3}$ mm. longis obtusis $\frac{2}{3}$ mm. latis margine ciliolatis tenuibus rubro-punctatis, sinibus inter lobos latiusculis eum lobis aequilatis obtusis. Stamina 4 lobis corollæ opposita basi corollæ affixa, eum lobis corollæ aequilonga, partibus liberis filamentorum $\frac{1}{2}$ – $\frac{1}{3}$ mm. longis basi latissimis latioribus quam longioribus facie interiore et margine ciliolatis tenuibus, antheris linearibus $\frac{2}{3}$ mm. longis basi reflexis apiculatis introrse dehiscentibus. Ovarium obovoideum $\frac{2}{3}$ mm. longum apice ad stylum $1\frac{1}{3}$ mm. longum abeuns, stylo columnari glabro, stigmate punctiformi. Fructus globosus 4 mm. in diametro siccus. Semina ignota.

HAB. Taitō: Daishizan, ad 6000 ped. alt., leg. U. MORI, Jan. 1908

(No. 4579 Fructus!); in Montibus Centralibus, leg. U. MORI, 1910 Dec. (Fruct.); Motsuu, leg. U. MORI, 1912, Juli. (Fr. et Fl.).

Near *Myrsine africana* LINN.; but differs from it by the not exserted anthers and smaller leaves with aristate serrature. I have examined several sets of the flowers and fruits, but I have never been able to find either ovule or seed. The plant may be of polygamous character, and the specimens may be male ones.

Oleaceæ.

Chionanthus LINN.

Chionanthus serrulatus HAYATA sp. nov. (Tab. XXVIII.) Rami recti fusco-cinerascentes glabri, cortice \pm soluto lenticellis et cicatricibus foliorum notato, ramulis rectis gracilibus pubescentibus complanatis, facie 2-sulcatis cicatricibus foliorum elevatis pulviniformibus. Folia obovato-oblonga rotundato-obovata usque ad 5 cm. longa 2.5-3 cm. lata apice obtusa vel rotundata ad summum retusa vel emarginata basi rotundata obtusa vel cuneata chartacea vel interdum membranacea margine serrulata prope basin integra, serrulis obtusis, venis primariis lateralibus utroque latere 5-6 subrectis apice furcatis a costa angulo 45° divaricatis tenuibus utraque pagine elevatis vel non elevatis, venulis secundariis minute reticulatis, utraque pagine subglabra ad costas et venas leviter hirsuta, petiolis circ. 1 cm. longis supra plano-sulcatis. Flores ad apicem ramulorum paniculati. Panicula terminalis basi perulata, perulis minutis triangularibus apice cuspidatis, pedunculis paniculorum ad apicem ramulorum solitariis vel geminis vel ternatim sitis, floribus ad apicem pedunculorum umbellatim 3-10 dispoditis, pedunculis gracillimis glabris 3-4 cm. longis interdum ternatim-ramosus interdum eramosis; umbella florum ad apicem pedunculorum 3-10-florata, radiis (pedicellis) 5-10 mm. longis gracillimis (bracteis nullis). Calyx alte 4-lobus, lobis linearis-lanceolatis glabris margine minute obsoleteque denticulatis vel integris utraque pagine 1-costatis 2 mm. longis basi $\frac{1}{2}$ mm. latis suberectis. Corolla alte 4-lobata, tubo $2\frac{1}{2}$ mm. longo subcampanulato, lobis 4 spathulato-linearibus 12-13 mm. longis versus apicem latioribus $2\frac{1}{2}$ mm. latis apice rotundatis deorsum leviter grada-

tim angustatis a basi 1 mm. latis tenuiter 1-costatis, (costis cum venis laterali-
bus tenuibus subparallelis, extrorse recurvatis revolutis, sinibus inter corollæ
lobos acutis. Stamina 2 ad basin corollæ tubi affixa, filamentis toto cum
corolla connatis, antheris adnatis oblongo-ovatis 1 mm. longis extrorse dehis-
centibus apiculatis glabris. Rudimentum ovarii 0. Fl. ♀ ignoti.

HAB. Tōyenchō: Kappanzan, leg. U. MORI et Y. SHIMADA, 1910, Mart.
(Fl.).

Closely resembles *C. retusus*, but differs from it by the much shorter petioles and minutely serrulate leaves. There is another specimen of this genus in the Tōkyō herbarium, which is labelled "Kōshū: Giokuzan, Mai., 1910, China." It is closely allied to our species, and may be regarded as identical with ours. The genus exists in North America, China and Japan (BENTH et HOOKER Gen. Pl. II. p. 677). Four species including the present one are known.

Apocynaceæ.

Tabernæmontana LINN.

***Tabernæmontana dichotoma* ROXB.**

HAB. Kōtōshō.

Determined by Mr. T. KAWAKAMI at Manila in his trip to the Philippines.

Loganiaceæ.

Geniostoma FORST.

***Geniostoma* sp.**

HAB. Kwashōtō.

Specimens insufficient for satisfactory determination.

Fagraea THUNB.

***Fagraea Sasakii* HAYATA n. sp.** (Tab. XXIX). Arbor 10 m. alta vel altiora,
rami et ramuli in exsiccato albo-cinerascentes glabri plus minus succulenti.

Folia opposita crassiuscula approximata oblonga oblongo-ovata vel oblongo-ovata usque ad 10 cm. longa $4\frac{1}{2}$ cm. lata \pm obliqua apice breve cuspidata ad summum obtusa vel simpliciter obtusa basi cuneata ad extremitatem attenuata utraque page glabra, costa supra plana subtus prominenti basi latiuscula ad petiolum abeunti, venis et venulis non conspicuus vel tenuissimis leviter elevatis, page supra subglaucous-nitida subtus pallidissima, petiolis 1-2 cm. longis basi subito dilatatis stipulam formantibus, stipulis enim petiolis connatis sub-intra-petiolaribus. Flores solitarii terminales, pedunculis validis 2 cm. longis infra medium 2-bracteatis, bracteis oppositis triangularibus 5 mm. longis crassiusculis. Sepala (vel segmenta calycis) 5 subrotundata 6 mm. longa valde imbricata margine hyalina. Corolla (alba?) infundibuliformis crassiuscula $4\frac{1}{2}$ cm. longa 5 cm. in diametro, tubo cylindrico-campanulato 3 cm. longo, lobis 5 patentibus rotundato-oblongis 2 cm. longis $1\frac{1}{2}$ cm. latis apice rotundatis basi non vel leviter contractis margine integris vel obscure denticulatis tenuibus, venis et venulis longitudinaliter reticulatis. Stamina 5, filamentis a basi usque ad medium cum corollæ tubo adnatis, partibus liberis 1 cm. longis complanatis, antheris oblongis 8 mm. longis 4 mm. latis utrinque obtusis basi alte 2-lobatis, lobis arete approximatis, dorsifixis apice obtusis connectivis leviter visis, connectivis linearibus, loculis 2 solidis. Ovarium ovoideum glabrum 5 mm. longum apice ad stylum $1\frac{1}{2}$ cm. longum attenuatum, stigmate dilatato eupuliformi. Bæcca ovoidea $3\frac{1}{2}$ cm. longa apice acuta breve apiculata viridis, sub exocarpio gummi exindens.

HAB. Kōshūn: Hieranzan, leg. B. HAYATA et S. SASAKI, Aug. 1912, fructus!; S. SASAKI, Feb. 1909, flores!

Near *Fagraea obovata* WALL., but differs from it in having much thinner shorter and broader leaves with an obtusely cuspidate apex. The structure of the anther-cells is very peculiar. They are perfectly solid, and in cross section there is seen practically no room for pollens. The anthers are apparently constituted of parenchymatous cells with numerous trabecules. On the surface of the anther-cells, there is a slit or rather a groove, and there we can find some pollens evidently scattered along the groove.

Boragineæ.

Ehretia LINN.

Ehretia glaucescens HAYATA sp. nov. Arbor: trunca erectus, versus apicem ramosus. Rami teretes, cicatricibus foliorum elevatis. Folia obovato-oblonga vel obovato-lanceolata apice abrupte acuminata vel breve caudata basi cuneata attenuata supra medium latissima 11 cm. longa 4 cm. lata in vivo supra viridissima nitida subtilis glauca chartaceo-membranacea, in exsiccato opaca, integerrima, venis lateralibus primariis utroque latere costæ 4-5 tenuissimis in vivo non visis, in exsiccato utraque pagine tenuissime elevatis, petiolis 1- $\frac{1}{2}$ cm. longis supra sulcatis. Flores paniculato-cymosi albi. Cymæ terminales paucifloratae, (exceptis pedunculis) 2-3 cm. longæ totiusque latæ, pedicellis ultimis 5-3 mm. longis interdum brevissimis subnullis apice peltato-dilatatis cum floribus articulatis, bracteis et bracteolis nullis. Calyx subglobosus vel obovatus 1 $\frac{1}{2}$ mm. longus vel longior utrinque glaber 5-lobatus, lobis rotundatis vel oblongis apice obtusis vel rotundatis $\frac{1}{2}$ - $\frac{2}{3}$ mm. longis. Corolla campanulato-hypocratheriformis utrinque glabra, tubo 4-5 mm. longo basi 1 mm. lato, apice gradatim dilatato, apice 3 mm. lato, limbo 5-lobato, lobis obovatis vel oblongis apice rotundatis 2-3 mm. longis integris reflexis. Stamina 5 ad medium tubi affixa longe exserta cum lobis corollæ alterna, filamentis vel partibus liberis filamentorum 5 mm. longis reflexis filiformibus, antheris late globosis a dorso compressis didymis, loculis fere distinctis a dorso medio leviter connatis $\frac{3}{4}$ mm. latis. Ovarium ovoidum 1 mm. longum glabrum, stylo 7-8 mm. longo filiformi apice 2-lobato glabro, lobis 1-2 mm. longis apice \pm dilatatis truncatis stigmatosis. Fructus globosus 1 cm. in diametro 4-pyrenus, pyrenis late oblongis 6-7 mm. longis 5 mm. latis complanatis leviter recurvis dorso irregulariter alte reticulatae foveolatis facie planis vel alte foveolatis. Semina non visa.

HAB. Kizan prope Mai, leg. B. HAYATA et S. SASAKI, Juli., 1912.

Near *E. longifolia* CHAMP; but differs from it by the much smaller corolla and rounded calyx-lobes. Nothing like this in the Indian, Chinese, Honkong and Japanese flora.

The plant was first collected by Mr. S. SASAKI and myself at Kisan near Maisha. The greenish leaves, which are shining above, but glaucous beneath, remind me of those of the lauraceous plants. Flowers are white and scentless. I saw another example of this tree at Kappanzan.

Ehretia longifolia CHAMP.; BENTH. Fl. Hongk. p. 234; FORBES et HEMSL. Ind. Fl. Sin. II. p. 145.

Ehretia laevis MATSUMURA (non ROXB.) in MATSUM. et HAYATA Enum. Pl. Formos. p. 254.

HAB. Kusukusu, leg. C. OWATARI Mart. 1898; B. HAYATA et S. SASAKI Juli. 1912.

It was found by Mr. S. SASAKI and myself at a sunny place on a mountain ridge at Kusukusu. This is the only example I have ever seen in my excursions. The flowers are perfect white. They are much shorter than those described in BENTH. Fl. Hongk. Tube of the corolla is 1 cm. long, lobes are 4 mm. long.

Solanaceæ.

Cestrum LINN.

Cestrum nocturnum LINN. cult.

Gesneraceæ.

Chirita HAM.

Chirita bicornuta HAYATA sp. nov. Herba circ. 1 m. alta vel minus alta; caulis glaber succulentus erectus sursum foliosus in exsiccato minute fusco-maculatus sursum leviter pubescens demum glabratus; folia radicalia non visa. Folia caulinis opposita æqualia vel obliqua oblongo-lanceolata vel oblanceolata lanceolata longe petiolata membranacea 10-15 cm. longa $2\frac{1}{2}$ -4 cm. lata apice acuminata basi acuta vel cuneato-attenuata gradatim ad petiolum abeuntia margine subintegra vel tenuissimæ obscureque dentata,

dentibus brevissimis, supra viridia subtus pallida subtus præter nervas et venis que glabra (sed ad nervos et venas pubescentia), supra ad costas et venas non pubescentia sed ad paginam tenuissime pubescentia, venis lateralibus primariis utroque latere costæ 10–9 arcuatis, petiolis longis vel brevioribus 2–4 cm. longis pubescentibus. Cymæ pauci- (sæpe 2–) floratae axillares oppositæ pedunculatae, pedunculis 2½ cm. longis, bractea una sub pedicello singulo sita, bracteis cum iis florum oppositorum connatis late ovatis rotundatis 1½ cm. longis florem amplectantibus margine integris apice rotundatis, pedicellis 4 mm. longis incrassatis. Calyx alte 5-lobatus, lobis late oblongis 8 mm. longis 4 mm. latis apice obtusis ad summum reflexis. Corolla cylindrico-campanulata obliqua in latere superiore 4 cm. longa in latere inferiore 4½ cm. longa, basi 6 mm. lata ad apicem limbi 2½ cm. lata fere ± incurva supra basin ampliata, sursum 2-labiata, (labio superiore 2-lobato, labio inferiore 3-lobato, lobis omnibus rotundatis), extus glabra intus latere anteriore (præter partem apicalem et basilarem) hirsuta basi annulariter 6 mm. supra basin hirsuta, cæterum glabra. Stamina corollæ tubo affixa; 2 anteriores perfecta, filamentis com-planatis 2 cm. longis glabris ascendentibus crispato-recurvatis, antheris late cordato-rotundatis 3½ mm. latis apice rotundatis basi emarginatis, loculis apice confluentibus; stamna posteriores sterilia, filamentis recurvatis 5 mm. longis, antheris 0. Ovarium cylindricum glabrum 8 mm. longum apice gradatim ad stytum abeuns, stylo glabro ascendentè-erecto 11 mm. longo apice brevissime descendente-recurvo truncato, stigmate terminali. Discus annularis 1 mm. altus margine obscure denticulatus. Capsula (sæpe in paria) cornuformis oblique ascendens cylindracea 22 mm. longa 4 mm. lata apice rostrata basi non contracta, valvis 2 interdum ad suturam superiorem a se deliscentibus, ad suturam inferiorem continuatis vel se solutis. Semina minutissima circ. ½ mm. longa angulari-oblunga, altra extremitate acuta, altra truncata, vel ultraque acuta longitudinaliter multi-costata et transverse reticulata.

HAB. Rinkiho, ad 5000 ped. alt., leg. H. INABA, 1911, Aug., (Typus! Fl.); Mt. Arisan, leg. B. HAYATA et S. SASAKI, 1912, Jan. (Fr.).

This has large ovate connate bracts like *C. eburnea* HANCE (in Journ. Bot. (1883) p. 168.).

Nyctagineæ.

Pisonia LINN.

Pisonia excelsa BL.; HOOK. Fl. Brit. Ind. IV. p. 711; MATSUM. Ind. Pl. Jap. II.-2, p. 75.

HAB. Kōshūn: Kuraru, leg. B. HAYATA, Mai. 1912. Loo-choo: Takarashima (No. 124), Yaezama: Ishigakijima, leg. KANASHIRO; Platas, leg. T. KAWAKAMI.

Pisonia morindæfolia R. BR. =(*P. alta*).

HAB. Platas, leg. T. KAWAKAMI.

Determined by Mr. T. KAWAKAMI at Manila in his trip to the Philippines.

Rafflesiaceæ.

TRIB. *Mitrastemonææ.*

(ENGL. Bot. Jahrb. LI. Heft-1, p. 173.)

Mitrastemon MAKINO.

Mitrastemon Kawasakii HAYATA in Tōkyō Bot. Mag. XXVI. p. 112.

As to the comment of this being referred to the Rafflesiaceæ, see the separate heading "On the systematic Position of *Mitrastemon*, as a Genus representing a special Tribe of the Rafflesiaceæ" in this volume p. 299 and also "Über die systematische Stellung von *Mitrastemon*, als einer neuen Gattung und besonderen Tribus der Rafflesiaceen," appeared in ENGL. Bot. Jahrb. LI., Heft-1, pp. 164-176, Taf. I.

Myristiceæ.

Myristica LINN.

Myristica simiarum A. DC.

HAB. Formosa: Loco non indicato (Herb. Taihoku Museum).

Laurineæ.

Cryptocarya Br.

Cryptocarya Konishii HAYATA Mater. Fl. Formos. p. 237. Descriptio auctata: Flores hermaphroditici paniculati, paniculis 6 cm. longis, (pedunculis 3 cm. longis) sursum ramosissimis, pedicellis (ramis ultimis) 1-2 mm. longis toto hirsutis. Calyx subcampanulatus basi tubuliformis hypocrateriformis, tubo 1 mm. longo, limbo 6-lobato, lobis 2-seriatim 3-meris oblongis obtusis basi \pm contractis valde imbricatis apice rotundatis $2\frac{1}{2}$ mm. longis utrinque hirsutis. Stamina perfecta 9 fance tubi affixa, (filamentis basi hirsutis $1\frac{1}{2}$ mm. longis, antheris oblongis circ. 1 mm. longis, connectivis valde productis, partibus productis $\frac{1}{3}$ mm. longis totiusque latis), ordinis primarii et secundarii eglandulosa, ordinis tertii utrinque glandula stipitata auctata; antheris ordinis primarii et secundarii introrsum 2-locellatis, ordinis tertii introrsum 2-locellatis; staminodia ordinis quarti triangulari-lanceolatis $1\frac{1}{2}$ mm. longis. Ovarium perianthii tubo inclusum longe obovatum apice attenuatum $1\frac{1}{3}$ mm. longum 1-ovulatum, stylo breviter exerto $1\frac{1}{2}$ mm. longo, stigmate oblique trunca.

HAB. Uraisha, 1910.

It is rather doubtful whether the stamens with gland-like bodies are those of the third order, or those of the second order.

Cinnamomum BURMAN.

Cinnamomum acuminatissimum HAYATA sp. nov. Rami graciles, in exsiccato fuscentes. Folia tenuiter coriacea oblanceolata ovato-lanceolata vel oblongo-lanceolata 9 cm. longa $2\frac{1}{2}$ -3 cm. lata apice longe acuminata ad summum obtusa basi cuneata supra nitida subtus subglaucescentia pinninervia, costis et venis utraque pagine tenuiter elevatis, venis lateralibus primariis utroque latere costæ 5-6 basilaribus a costa angulo 20° egressis, petiolis 1- $1\frac{1}{2}$ cm. longis supra late sulcatis. Flores paniculati, paniculis terminalibus a basi ramosis 3 cm. longis. Perianthium campanulato-rotatum utrinque pubes-

cens, tubo 1 mm. longo, limbo 6-lobato, lobis elongato-lanceolatis apice obtusis $2\frac{1}{2}$ mm. longis, tubo intus dense barbato. Stamina perfecta 9, 2 mm. longa, (filamentis subglabris vel ad basin hirsutis), ordinis I. et II. eglandulosa, antheris introrsum 4-locellatis, ordinis III. glandulosa stipitatis utroque latere basis filamentorum instructa, antheris extorsum 4-locellatis; staminodia ordinis IV. 1 mm. longa apice subsagittæformia. Ovarium glabrum ovoidem $\frac{2}{3}$ mm. longum, stylo $1\frac{1}{2}$ mm. longo.

HAB. Taishō: leg. FURUKAWA, 1910, Mart., (Fl.).

Cinnamomum camphoroides HAYATA sp. nov. Rami glabri fulvescentes. Folia versus apicem ramulorum disposita ovato-oblonga usque ad 8 cm. longa $2\frac{1}{2}$ cm.- $3\frac{1}{2}$ cm. lata apice acuminata vel acuta ad summum obtusa basi acuta tenuiter coriacea vel chartacea 3-nervia (nervis supra basin usque ad 5 mm. connatis) supra nitida, (nervis et venis utraque pagine tenuiter elevatis, nervis lateralibus rectis), petiolis 2-3 cm. longis. Flores cymoso-paniculati, paniculis terminalibus 5 cm. longis 6 cm. latis, (in alabastro globosis), perulis rotundatis 7 mm. longis totiusque latis extus sericeo-tomentosis intus tenuiter hirsutis), pedicellis 3 mm. longis, bracteis ovatis $\frac{1}{2}$ mm. longis hirsutis. Perianthium campanulato-rotatum 5 mm. in diametro, tubo circ. 1 mm. longo, lobis rotundato-oblongis intus dense hirsutis, cæterum ut *C. Camphoræ*.

HAB. Kōshūn: leg. N. KONISHI.

Differs from *C. Camphora* by the terminal densely flowered panicles.

Cinnamomum insulari-montanum HAYATA sp. nov. Rami et ramuli glabri recti graciles. Folia glaberrima tenuiter coriacea oblonga vel ovato-oblonga 6 cm. longa 22 mm. lata apice obtuso-acuta acuta acuminata ad summum acuta vel obtusa basi obtusa ad extremitatem breve attenuata ad petiolum abeuntia supra nitida subtus glauca 3-nervia, venis nervi centralis utroque latere 2, nervis lateralibus rectis a costa angulo 20° divaricatis, nervis et venis utraque pagine tenuissime elevatis, subtus venuis tenuiter reticulatis, petiolis 8-10 mm. longis supra late sulcatis. Cymæ

terminales 3 cm. longæ totiusque latæ, ramis patentibus 2½ cm. longis apice 3-natim florem gerentibus, pedicellis (ramis ultoribus) 6–7 mm. longis. Perianthium campanulato-hypocratheriforme 4 mm. longum, tubo 1 mm. longo totiusque lato, limbo 6-lobato, lobis oblongis extus glabris intus dense hirsutis 2½ mm. longis apice obtusis basi ± contractis. Stamina perfecta 9, fauce tubi affixa 2 mm. longa, filamentis basi hirsutis 1½ mm. longis vel subglabris, antheris truncato-oblongis 1 mm. longis apice truncatis vel ± emarginatis, connectivis non productis, ordinis primarii et secundarii introrsum 4-locellatis, ordinis tertii extrorsum 4-locellatis; stamna ordinis tertii medio filamentorum utroque latere glandula sessili (glandulis antheræformibus oblongis) instructa; staminodia ordinis quarti 1½ mm. longa apice dilatata sagittæformia hirsuta. Ovarium ovoidem 1 mm. longum, apice ad stylum 1½ mm. longum abeuns, stylo apice dilatato infundibuliformi 3-lobato.

HAB. Monte centrali, leg. U. MORI, Dec. 1909.

Near *C. Dæderleinii* ENGL., differs from it by the glabrous flowers and ovately oblong leaves.

Cinnamomum Kanahirai HAYATA sp. nov. Rami validiuseuli, ramulis validiuseulis glabris fuseo-purpurascens in exsiccato. Folia coriacea oblonga ovato-oblonga usque ad 7 cm. longa usque ad 4 cm. lata apice subito acuminata vel acuminata basi obtusa rotundata acuta ad extremitatem subito-acuta pinnivena vel 3-nervia vel 5-nervia, (nervis basilaribus tenuissimis, nervis lateralibus supra basin usque ad 3 mm. connatis), supra subnitida, costis et venis utraque pagina tenuiter elevatis, venulis minutissime reticulatis vix conspicuis, petiolis 1–2 cm. longis sursum subalatis supra late sulcatis. Flores ignoti. Tubus perianthii fructifer persistens campanulato-cupuliformis 1 cm. in diametro. Bacca depresso-globosa 13 mm. longa 15 mm. in diametro apice depresso-truncata. Semina globosa 10 mm. in diametro testa crustacea.

HAB. Nanshōshichō: Kali-zenzan, ad 4000 ped. alt., Oct. 1912, leg. R. KANAHIRA.

Near *C. micranthum* HAYATA, but differs from it by the much larger fruits and in the leaves which are sometimes 3-nerved, and strong scented.

Cinnamomum macrostemon HAYATA sp. nov. Ramuli recti graciles glabri. Folia chartacea supra subnitida subitus opaca ovato-lanceolata ovato-oblonga vel oblongo-lanceolata apice acuminata ad summum obtusa basi acuta vel subito acuta 10 cm. longa 3 cm. lata trinervia, nervis lateralibus supra basin usque ad 3 mm. connatis, nervis et venis supra tenuibus subitus tenuiter prominentibus, venis primariis lateralibus et venulis tenuissimis, petiolis 1 cm. longis supra late sulcatis. Flores cymoso-paniculati, paniculis axillaribus vel terminalibus 2-3 cm. longis, rhachidibus pubescentibus tetragonis, pedicellis 4-5 mm. longis. Perianthium late campanulato-rotatum utrinque pubescens alte 6-lobatum, lobis angustato-elongato-oblongis 6 mm. longis 2 mm. latis apice obtusis. Stamina perfecta 9, 5 mm. longa, (filamentis hirsutis, antheris angustatis 2 mm. longis $\frac{1}{2}$ - $\frac{2}{3}$ mm. latis); ordinis I. et II. glandulosa, antheris introrsum 4-locellatis; ordinis III. utroque latere glandula sessili ad medium filamentorum instructa, antheris extrorsum 4-locellatis; staminodia ordinis IV. 3 mm. longa apice sagittæformia hirsuta. Ovarium obovoideum 1 mm. longum, stylo 3 mm. longo, stigmate dilatato 3-lobato.

HAB. Tainan, leg. S. NAGASAWA, Aprili. 1910, (No. 155).

Cinnamomum micranthum HAYATA n. n.

Machilus micranthum HAYATA, Ic. Pl. Formos. II. p. 130.

Cinnamomum nomine HAYATA n. n. *Cinnamomum Camphora* NEES et EBERM. var. *nomine* HAYATA in MATSUMURA et HAYATA Enum. Pl. Formos. p. 349. Suffrutex semper humilis 1 m. alta nunquam altior nunquam arborescens. Rami in exsiccato fuscentes ramosi. Folia tenuiter coriacea vel chartacea oblonga oblongo-ovata vel oblongo-rhomboidea usque ad 7 cm. longa circ. 2-3 cm. lata, apice acuminata basi vel subito attenuata vel cuneata 3-nervia, nervis basi supra basin 1 cm. connatis, (præterea nervis basilaribus tenuissimis a basi distinctis), supra nitida subitus opaca, (venis secundariis transversis utraque pagine tenuissimis non elevatis, nervis utraque pagine tenuissime elevatis) margine nervo-marginata, petiolis 1-2 cm. longis supra sulcatis. Flores cymosi, cymis pauci- et laxi-floratis axillaribus 3-6 cm. longis. Perianthium subrotatum

4 mm. in diametro late 6-lobatum, lobis extus subglabris intus hirsutis oblongis 1 mm. latis obtusis. Stamina perfecta 9, I. et II. ordinis eglandulosa, antheris introrsum 4-locellatis, ordinis III. glandulis stipitatis instructa, antheris extrorsum 4-locellatis; ordinis IV. staminodia rhomboideo-cuspidiformia stipitata. Ovarium globosum, stigmate dilato. Calycis Tubi fructiferi campanulato-cupuliformes 4-5 mm. in diametro; baccis globosis 6 mm. in diametro basi rostratis.

HAB. Kōshūn, Kuraru, leg. B. HAYATA, Mai. 1912.

This was described as a variety of the common camphor tree. It is a shrub nearly 1 m. high. It does not produce camphor. The flowers are a little smaller than those of the camphor tree. The apical portions of staminodes are not sagittate, but rhombic. It is better be regarded as specifically distinct from the latter.

Cinnamomum obovatifolium HAYATA sp. nov. Rami glabri. Folia obovata tenuiter coriacea 3-4 cm. longa 1-2 cm. lata apice rotundata obtusa vel rarius acuta basi obtusa vel cuneata supra subnitida subtus subglauca pinninervia, costis et venis supra planis non elevatis, subtus tenuissime elevatis sed distinete coloratis, venulis minute reticulatis, venis lateralibus primariis utroque latere costæ 4 apice arcuatis cum venis superioribus areolam formantibus, petiolis brevibus 5 mm. longis supra late sulcatis. Cymæ axillares pance-floratae 2 em. longæ. Perianthium 6-lobatum extus glabrum intus subglabrum basi barbatum. Cæterum ut *C. Camphoræ*.

HAB. Kusukusu, leg. B. HAYATA et S. SASAKI, 1912, Juli.

Near *C. reticulatum* HAY., but differs from it by the pinninerved leaves and much smaller flowers.

Cinnamomum pseudopedunculatum HAYATA sp. nov. Rami et ramuli recti graciles rubescentes vel pallidiusculi. Folia in magnitudine et forma variabilima tenuiter coriacea ovata oblonga ovato-oblonga vel ovato-lanceolata apice obtusissima obtusa acuta vel acuminata, sed ad summum semper obtusa, basi rotundata obtusa acuta breve attenuata 4-9 cm. longa 1½-4½ cm. lata 3-nervia, nervis basi usque ad 5-10 mm. connatis, præterea 2 nervis basilaribus tenuibus a basi solutis, nervis et venis utraque

pagine leviter elevatis vel supra planis basi reticulatis, venis transversis non distinctis, supra nitida subtus \pm glauca, petiolis 1-2 cm. longis complanatis supra late sulcatis sursum \pm alatis. Cymæ paucifloratæ 3-floratæ pedunculatæ axillares, pedunculis 1 cm. longis glabris. Perianthium 5-lobatum, lobis 6 oblongo-rotundatis 2 mm. longis apice obtusis extus glabris intus hirsutis margine sub microscopio denticulatis. Stamina perfecta 9, filamentis hirsutis, ordinis tertii glandulis sessilibus utroque latere medio instructis; staminodia sagittæformia. Ovarium ovoidem apice ad stylum abeuns, stigmate capitato 3-lobato. Pedunculi fructiferi erecti 1½ cm. longi, pedicellis fructiferis 1½ cm. longis erectis, tubo perianthii persistenti dilatato cupuliformi 4 mm. in diametro. Fructus ellipsoideus 8 mm. longus apice rotundatus ad centrum 1-punctatus.

HAB. Bonin: Chichijima et Hahajima, leg. H. HATTORI, 1905, Aug.

Near *C. pedunculatum*, but differs chiefly by the venation of the leaves, shorter peduncles and less-flowered cymes.

Machilus NEES.

Machilus longipaniculata HAYATA sp. nov. (Tab. XXX.) Rami in exsiccato nigricantes glabri. Folia lanceolata obovato-lanceolata vel oblongo-lanceolata tenuiter coriacea vel chartacea apice acuminata basi cuneato-obtusa 10-13 cm. longa 3-3½ cm. lata, in exsiccato utraque page opaca, \pm rubescens subtus \pm glauca, pinninervia, costis supra impressis subtus elevatis, venis lateralibus primariis tenuissimis, petiolis 2 cm. longis. Paniculæ longissimæ 10-20 cm. longæ, ad axillas foliorum superiorum, pedunculis longissimis, ramis brevibus 1½ cm. longis, ad apicem ramorum floribus 3-6-fasciculatim dispositis, pedicellis ultimis 4 mm. longis. Perianthium 6-lobatum, lobis patentissimis extus breve hirsutis intus parcissime hirsutis exterioribus anguste oblongis 3½ mm. longis apice obtusis interioribus latioribus, tubo dense hirsuto. Stamina perfecta 9, 2 mm. longa, filamentis glabris. Ovarium cum stylo glabrum.

HAB. Uraisha, leg. N. KONISHI, 1910, Mart. (Fl.).

Machilus longisepala HAYATA sp. nov. Rami graciles in exsiccato fuscentes. Folia tenuiter coriacea vel chartacea, oblongo-oblanceolata apice



Fig. 21.

Actinolaphne citrata (BLUME.) 1, a branch; 2, a leaf; 3, a flower-umbel; 4, a bract; 5, a flower; 6, 7, calyx-lobes; 8, limb of the calyx, expanded; 9, 10, stamens of one kind, seen from different sides; 11, 12, stamens of another kind; 13, 14, 15, stamens of another kind; 16, a rudimentary ovary; 17, a branch with a fruit; 18, a fruit; 19, vertical section of the same. Fig. 1, 2 and 17, $\times \frac{3}{4}$; others are variously magnified.

acuta vel acuminata ad summum obtusa basi cuneata vel cuneato-obtusa 6-8 cm. longa 2 cm. lata, costis supra sulcatis subtus prominentibus, venis lateralibus primariis tenuissimis subtus leviter elevatis, petiolis 1 cm. longis supra late sulcatis. Paniculæ 4-5 ad apicem ramorum fasciculatae 8 cm. longæ, pedunculis 5 cm. longis, ramis 1-1½ cm. longis, floribus ad apicem ramorum 2-3-4- fasciculatim dispositis, pedicellis ultimis 3 mm. longis. Perianthium 6-lobatum utrinque hirsutum, lobis oblongis. Stamina perfecta 9, staminodia 3.

HAB. Kusukusu.

Notaphœbe BLUME.

Notaphœbe Konishii HAYATA n. n. = *Machilus Konishii* HAYATA Mater. Fl. Formos. p. 240.

The plant should better be referred to *Notaphœbe*, for the staminodes of the fourth order are very small and subulate, the segments of the perianth are rather thin, and the plant does not look like a species of the *Machilus* allies.

Actinodaphne NEES.

Actinodaphne citrata (BLUME.) (Fig. 21.). = *Litsea citrata* BLUME; HAYATA Mater. Fl. Formos. p. 247.

OBSERV. Rami glabri nigricantes, ramulis gracilibus. Folia alterna petiolata subpersistentia membranacea lanceolata 7 cm. longa 16 mm. lata apice acuminata basi acuta vel obtusa, costis et venis utrinque paullum elevatis, venis primariis gracillimis, petiolis 8 mm. longis. Umbellæ florum racemose dispositæ, racemis axillaribus 1½ cm. longis, pedicellis umbellarum 8 mm. longis, vel racemis in umbellam unam reductis. Umbellæ 4-floratae, basi bracteis 4 persistentibus globosis 4 mm. longis 5-nervatis apice rotundatis membranaceis glabris. Perianthium 6-partitum glabrum, segmentis late ovatis obtusis 2 mm. longis 1½ mm. latis integris vel denticulatis. Stamina 9 omnia perfecta 2 mm. longa segmento perianthii æqualia, filamentis glabris linearibus, ordinis primarii et secundarii eglandulosa, ordinis tertii glandula breve stipitata utrinque aucta, antheris omnibus introrsum 4-locellatis. Rudimentum ovarii minutum. Fl. ♀: ignoti. Bæcca globosa nigricans 5 mm. longa, perianthii tubo non accrescenti insidens, segmentis calycis deciduis.

Actinodaphne morrisonensis HAYATA n. n. *Litsea morrisonensis* HAYATA Mater. Fl. Formos. p. 250.

Actinodaphne nantœnsis HAYATA n. n. *Litsea nantœnsis* HAYATA Mater. Fl. Formos. p. 251.

Litsea LAM.

Litsea Kawakamii HAYATA sp. nov. Arbor, ramis robustis subglabris. Folia alterna in magnitudine variabilia ovato-lanceolata vel obovato-lanceolata vel lanceolata 25–40 cm. longa 6–15 cm. lata apice obtusa cuneato-obtusa vel acuta basi cuneata ad petiolum decurrentia chartacea vel chartaceo-membranacea vel chartaceo-coriacea margine integra utraque page glabra subtilis glauca, costa supra plana 4 mm. lata subtus prominenti, venis lateralibus supra planis subtus elevatis gracilibus utroque latere costæ circ. 20 subrectis prope marginem evanescentibus a costa circ. 50° divaricatis, venulis minute reticulatis, reticulis utraque elevatis, margine integerrima, petiolis $2\frac{1}{2}$ cm. longis supra late canaliculatis basi non incrassatis. Cymæ axillares fructiferæ acutæ incrassatæ, ramis incrassatis, pedicellis fructiferis valde acutis $1\frac{1}{2}$ em. longis validis cum calyce continuis. Cupula calycis fructiferi patelliformis 3 cm. in diametro 7 mm. alta, cicatricibus planis 17 mm. in diametro. Bacca compresso-globosa 3 cm. in diametro 22 mm. alta, in cupula insidens, 1-sperma primum alba demum rubra. Semina obovato-compresso-globosa $2\frac{1}{2}$ cm. in diametro 2 cm. longa apice subplana basi rotundata, testa membranacea levi; albumen 0, cotyledones semi-globosæ, caudicula infra apicem immersa.

HAB. Kōtōshō, leg. Y. TASHIRO et T. KAWAKAMI, Aug. 1912.

Very imperfect specimen. Through the courtesy of Mr. E. D. MERRILL, Bureau of science, Manila, I was able to find that it belongs to *Litsea* and is closely allied to the Philippine *L. Garciae* VID. (in Rev. Pl. Vasc. Filip. p. 228). I have compared our specimens with the Philippine species, and found that ours are different from the Philippine, so far as I can judge through the description of the latter, in having cuneately based leaves and smaller fruits.

Tetradenia NEES.

Tetradenia acuminatissima HAYATA, sp. nov. Rami graciles in exsiccato fulvescentes glabri. Folia ovato-lanceolata vel lanceolata tenuiter coriacea vel chartacea 6–9 cm. longa 18–25 mm. lata apice gradatim acuminata vel subito acuminata ad summum obtusa basi obtusa vel acuta pinninervia, venis lateralibus primariis utroque latere costæ 5 a costa angulo variabilimo egressis, costis supra elevatis subtus sub-planis, venis supra tenuissime sed distincte elevatis subtus planis distinctis, supra subnitida, petiolis 1–1½ cm. longis. Fl. ♂: alabastrum cymæ globosum axillare vel laterale, floribus fasciculatis, fasciculis breve pedunculatis; flores apertientes non visi; stamina 6. Fl. ♀: flores breve pedicellati 3–4-fasciculati, fasciculis sessilibus 2–4 ad pedunculos breves sitis, pedunculis lateralibus vel axillaribus brevisimis 3 mm. longis; fasciculis florum sessilibus basi 1-bracteatis, bracteis semi-rotundatis 1 mm. longis 2 mm. latis basi latere subauriculatis incrassatis; bracteis involueri fasciculorum rotundatis oblongis valde concavis 3 mm. longis basi contractis margine ciliatis dorso paree hirsutis, pedicellis 3 mm. longis dense hirsutis. Perianthium 4-lobatum, lobis concavis obovato-oblongis 2 mm. longis. Staminodia 6–8, exteriora eglandulosa linearia 1½ mm. longa hirsuta, interiora ± longiora utroque latere glandulis sessilibus instructa. Ovarium obovoideum 1 mm. longum, stylo aequilongo hirsuto, stigmate oblique 2-lobato. Fructus globoso-ovoideus 7 mm. longus, perianthiis persistentibus, pedicellis hirsutis 1 mm. longis.

HAB. Tōzan, leg. G. NAKAHARA, 1907, Nov. (Fr.); Arisan, leg. S. SASAKI, 1911, Mart. Fl. ♀.

Tetradenia acuto-trinervia HAYATA sp. nov. Rami fuscentes tenuiter pubescentes. Folia tenuiter coriacea lanceolata obovato-lanceolata 9 cm. longa 2½ cm. lata supra subnitida subtus glauca tenuiter adpresso longeque hirsuta apice caudato-acuminata acuminata basi acuta vel acuminata 3-nervia, nervis lateralibus usque ad 5 mm. supra basin connatis angulo acuto a nervo centrali divaricatis, nervo centrali supra tenuiter elevato, nervis lateralibus supra impressis, nervis venisque subtus prominentibus, venulis transversis,

petiolis $\frac{1}{2}$ –1 cm. longis supra subplanis. Flores apertientes non visi, fasciculis florum lateralibus vel axillaribus. Stamina 6, 4-locellatis.

HAB. Mt. Morrison, leg. U. MORI, 1907, Oct. Fr.

Tetradenia aurata HAYATA n. n. = *Litsea aurata* HAYATA Mater. Fl. Formos. p. 246.

Tetradenia Konishii HAYATA n. n. = *Litsea Konishii* HAYATA Mater. Fl. Formos. p. 248.

Tetradenia variabillima HAYATA sp. nov. Arbor. Folia obovato-lanceolata elongato-obovata ovato-lanceolata vel lanceolata vel obovata vel ovata, 8–15 cm. longa circ. 4 cm. lata apice acuminata vel subito acuta, basi cuneato-attenuata cuneata vel acuta vel obtusa trinervia tenuiter coriacea, nervis lateralibus usque ad supra basin 5–15 mm. connatis, nervis et venis supra tenuiter impressis vel elevatis subtus prominente elevatis, supra nitida subtus glauca primum tenuiter adpresse hirsuta demum glabra. Fl. ♀ breve pedicellati, 2–4-fasciculati, fasciculis axillaribus vel lateralibus bracteis 4–5 involucratis sessilibus 5–6 brevissime spicatum dispositis, spicis brevissimis 3 mm. longis, bractea una basi fasciculorum sita semirotundata $2\frac{1}{2}$ mm. longa; bracteis involueri elongato-rotundatis 4 mm. longis in numero 4–5, pedicellis 2 mm. longis dense hirsutis. Perianthium 4-lobatum, lobis rotundatis extus hirsutis intus glabris. Staminodia 6–9, alia subulata $1\frac{1}{2}$ mm. longa eglandulosa, alia utroque latere basi glandulis stipitatis instructa. Ovarium ovatum, stylo hirsuto, stigmate lato. Fructus elliptico-globosus 8 mm. longus.

HAB. Arisan, leg. B. HAYATA, Jan. 1911.

Lindera THUNB.

Lindera strychnifolia VILLAR; FORBES et HEMSL. Ind. Fl. Sin. II. p. 392.

HAB. Fokien: Isan, leg. S. NAGASAWA, 1910, Aprili.

Balanophoreæ.

Balanophora

Balanophora formosana HAYATA sp. nov. Planta 20 cm. alta simplex dioeca cylindrico-teres. Volva obconico-turbinata 3 cm. in diametro totiusque longa apice depressa basi subito-acuta facie profunde rugoso-verrucosa. Scapi 16 cm. longi a basi usque ad medium imbricatim squamiferi, squamis imbricatis in magnitudine variabilis, inferioribus brevioribus, superioribus longioribus, lanceolatis apice obtusissimis. Spicæ fl. ♂: cylindraceæ 10 cm. longæ (pedunculis exceptis) 1½ cm. latae (cum floribus), floribus dense dispositis, bracteis 0. Alabastrum florum ♂ depresso-globosum supra basin constrictum. Perianthii tubus brevissimus ½ mm. longus, inter tubum et limbum leviter constrictus. Fl. ♂ apertientes sessiles 6½ mm. in diametro; perianthii segmenta 6-5-4 valvata ovato-oblunga vel polygona 2½ mm. longa apice obtuso-acuta vel truncata. Stamina 10-12 sessilia connata. Spicæ fl. ♀: cylindraco-obclavatiformes 7-8 cm. longæ medium 2 cm. latae infra medium latissimæ, facie corporibus dense dispositis, corporibus late claviformibus 1 mm. longis basi stipitiformibus apice truncatis a centro depresso, basi ovarii multis instructis.

HAB. Formosa meridionalis, leg. S. SASAKI.

Balanophora mutinoides HAYATA sp. nov. (Tab. XXXI.) Herba circ. 10 cm. alta dioeca simplex. Volva campanulato-cupuliformis crustacea verrucosa. Scapi teretes 10 cm. longi 6-7 mm. in diametro glabri a basi usque ad medium squamosi, (squamis multis, inferioribus brevibus rotundatis, superioribus elongatis 4 cm. longis 1½ cm. latis), apice dense capitatum flores gerentes. Capitula ♂: conico-globosa 1½-2 cm. longa 1½ cm. lata. Receptaculum dense alteque foveolatum, in foveolam singulam florem unum gerens, bractea una sub flore singulo disposita lunuliformi peltata. Flores ♂ pedicellati, pedicellis 2 mm. longis. Perianthium 3-partitum, segmentis rotundato-triangularibus 2 mm. longis 3 mm. latis. Stamina 3 sessilia connata, antheris transversim sitis, oblongis 2 mm. longis 2-locellatis. Capitula ♀: conico-globosa 2 cm. longa, corporibus dense instructa, corporibus claviformibus 1 mm. longis apice

truncatis. Ovarium basi corporis dense congestum minutum fusiformi-filiforme cum stylo $\frac{1}{2}$ mm. longum.

HAB. Arisan-Tozan, leg. S. SASAKI, Mart. 1911.

Somewhat allied to *B. involucrata* in the structure of the male flowers; but quite different in the absence of involucres.

Euphorbiaceæ.

Sarcococca LINDL.

***Sarcococca pruniformis* LINDL. var. *diœca* HAYATA** (Fig. 22) Ic. Pl. Formos. II. p. 130.

OBSERV. Frutex, ramis gracilibus fuscentibus minute pubescentibus vel subglabris teretibus. Folia alterna exsiccato fuseo-rubescens lanceolata pinnivena breve petiolata 8 cm. longa 2 cm. lata utrinque acuminata vel apice acuminata basi attenuata ad petiolum brevem 1- $\frac{1}{2}$ cm. longum abeuntia coriacea margine integra recurvata, costis supra impressis vel elevatis, supra glabra subtus sub microscopio minute lepidota rubro-ferruginea vel pallidissima, venis primariis lateralibus utrinque inconspicuis primum rectis prope marginem abrupte flexuosis recurvis ascendentibus venam superiorem attingentibus. Flores ♀ spicato-racemosi, (racemis brevibus 1-2 cm. longis), cum pedicellis 9 mm. longi, (pedicellis 6 mm. longis), 1-bracteati, (bracteis lanceolatis), 8-bracteolati, bracteolis oppositis 4-seriatim imbricatimque dispositis obovatis breve cuspidatis in forma sepalum sub-æquantibus gradatin ad sepalum abeuntibus. Sepala 4 obovata breve obtuseque cuspidata 3 mm. longa 1 $\frac{2}{3}$ mm. lata margine ciliolata. Ovarium 2-carpellare glabrum cum stigmatibus 3 mm. longum, stigma plus minus recurvatum. Fructus ignotus.

HAB. Montibus Centralibus, leg. U. MORI, April., 1910.

Near *S. pruniformis* LINDL. (FORBES et HEMSL. Ind. Fl. Sin. II. p. 418 = *S. trinervia* WIGHT, Ic. t. 1877); but differs from the type by the much longer pedicels of the female flowers and by the lanceolate leaves.

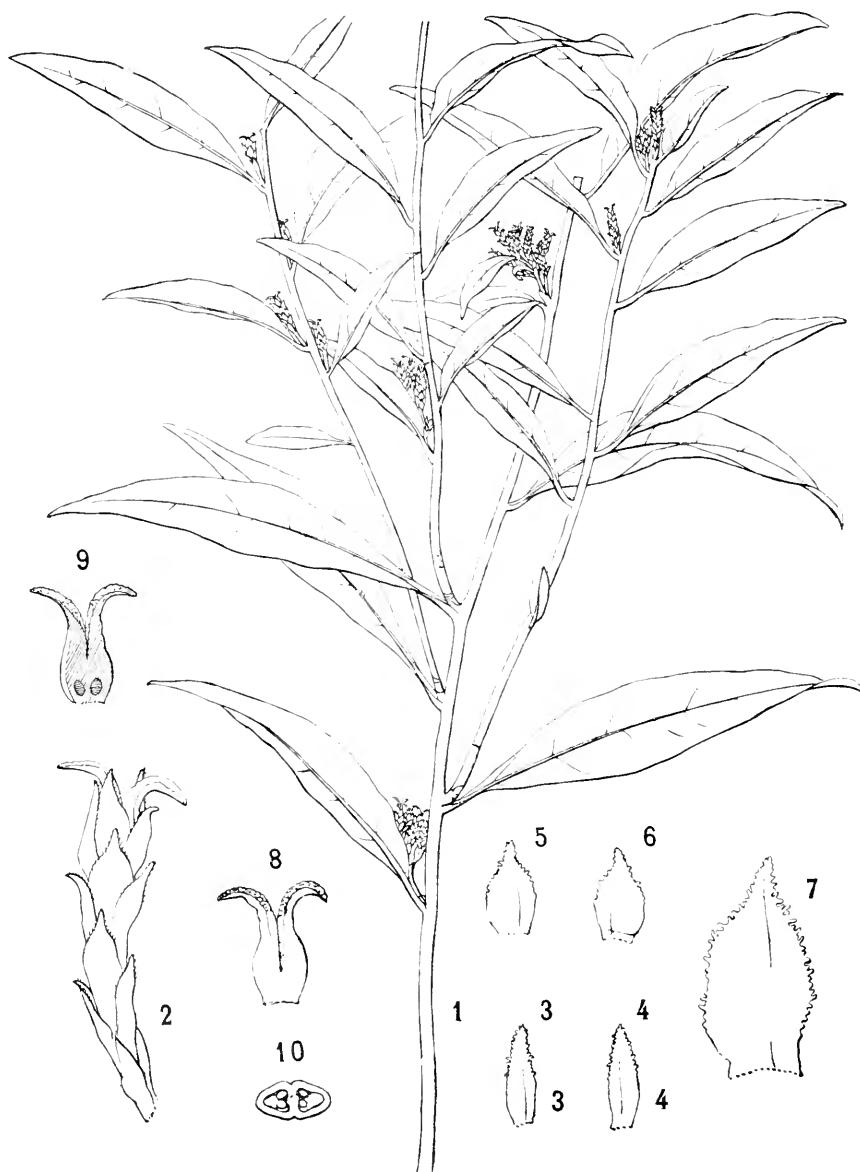


Fig. 22.

Sarcococca pruniformis LINDL. var. *dioica* HAYATA. 1, a branch; 2, a flower; 3, 4, 5, 6, bracts, from outer to inner; 7, a sepal; 8, an ovary; 9, vertical section of the same; 10, cross section of the same. Fig. 1, $\times \frac{3}{4}$; others are variously magnified.

Pachysandra MICH.

Pachysandra axillaris FRANCH. var. **tricarpa** HAYATA (Fig. 23) Ic. Pl. Formos. p. 129.

OBSERV. Frutescens, 20–30 cm. alta; caulis simplex teres glaber sub lente brevissime pubescens sursum foliatus. Folia longe petiolata alterna ovato-oblonga vel elongato-oblonga 7–8 cm. longa $3\frac{1}{2}$ cm. lata apice acuta abrupte acuminata vel caudata basi rotundata plus minus obliqua margine sursum paucے subdentata deorsum integra, dentibus brevibus, subtrinervia vel pinnivena subcoriacea vel membranaceo-coriacea utraque pagine subglabra sub lente minute pubescentia, venis utrinque prominentibus. Flores monœcii spicati, spicis axillaribus $1\frac{1}{2}$ cm. longis dense floratis (floribus infimis unicis ♀. reliquis ♂) breve pedunculatis, pedunculis 4 mm. longis. Fl. ♂: subsessiles 1-bracteati, bracteis subtriangularibus breve pubescentibus $1\frac{1}{2}$ mm. longis. Perianthii segmenta 4, 2-seriatim oppositimque disposita oblonga $3\frac{1}{2}$ mm. longa $2\frac{1}{2}$ mm. lata apice rotundata basi contracta crassiuseula margine ciliata concava obscure 5-nervia subglabra. Stamina 4, segmentis perianthii opposita distincta $6\frac{1}{2}$ mm. longa validiuscula erecto-patentia, filamentis complanatis $4\frac{1}{2}$ mm. longis glabris $\frac{1}{2}$ mm. latis, antheris 2 mm. longis $\frac{1}{2}$ mm. latis adnatis obscure apiculatis. Rudimentum ovarii brevissimum quadrangulare $\frac{3}{4}$ mm. latum. Fl. ♀: subsessiles 6 mm. longi 1-bracteati 4-bracteolati, bracteolis valde imbricatis. Perianthii segmenta 5, imbricata 3 mm. longa oblonga apice obtusa margine ciliolata. Carpella 3 basi connata extrorse recurvata, stigmatibus linearibus sub lente minute pubescentibus, ovulis 2 in carpellis singulis. Fructus ignoti.

HAB. Tonkarankei, leg. T. KAWAKAMI et U. MORI, Aprili., 1910.

Resembles the type in having axillary spikes, and three nearly distinct carpels; but differs from it by the acuminate or nearly caudate oblong leaves, much longer anthers and more recurved carpels.

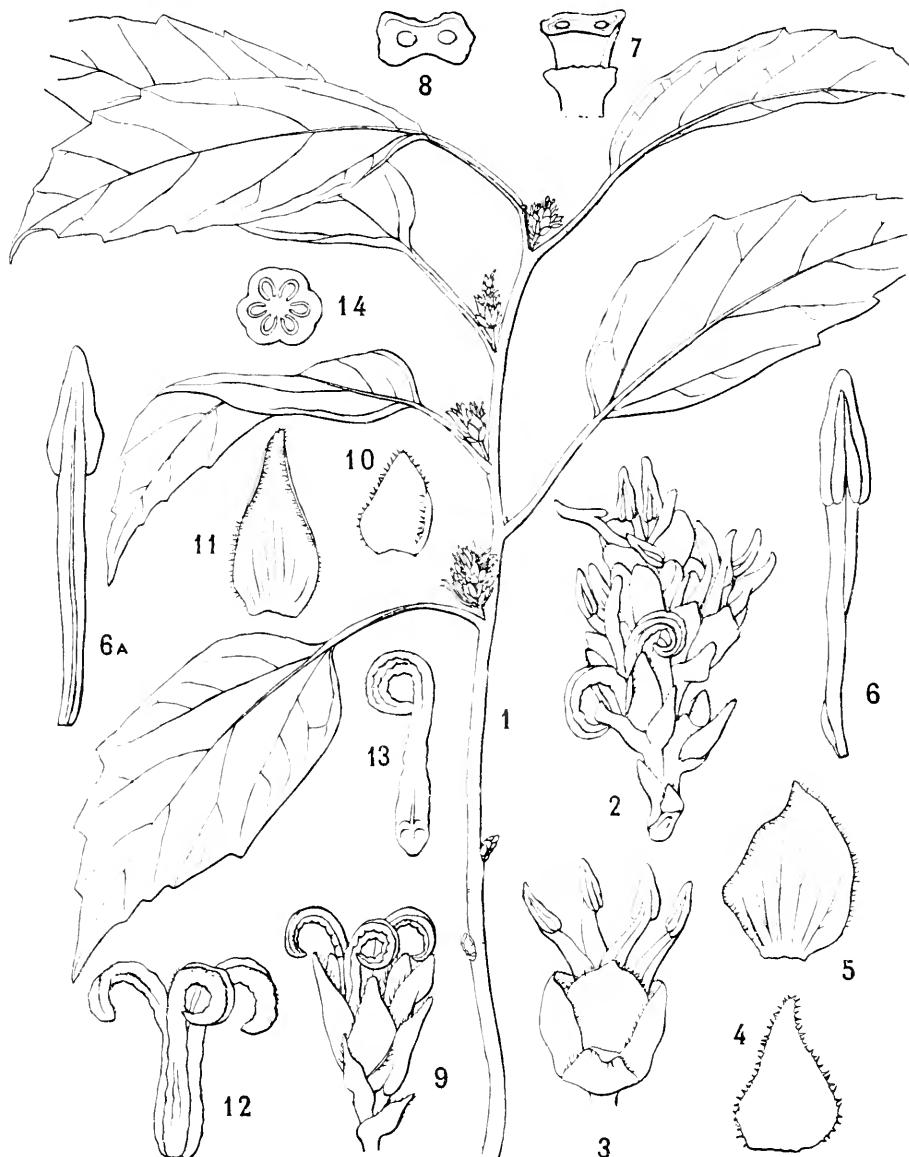


Fig. 23.

Pachysandra axillaris FRANCH. var. *tricarpa* HAYATA. 1, the plant; 2, a raceme; 3, a male flower; 4, a bract of the same; 5, a sepal of the same; 6, 6A, a stamen, seen from different sides; 7, rudimentary ovary of the same; 8, the same seen from above; 9, a female flower; 10, a bract of the same; 11, a sepal of the same; 12, a pistil; 13, a carpel; 14, cross section of an ovary. Fig. 1, $\times \frac{3}{4}$; others are variously magnified.

Macaranga THOUARS.**Macaranga dipterocarpifolia** MERRILL.

HAB. Kashōtō, leg. G. NAKAHARA, Feb. 1906 (No. 1042); Kōtōshō, leg. T. KAWAKAMI et S. SASAKI, Juli. 1912 (No. 30).

Compared with a specimen from the Philippines.

Excæcaria LINN.**Excæcaria formosana** HAYATA n. n.

Excæcaria crenulata WIGHT var. *formosana* HAYATA Mater. Fl. Formos. p. 271 (1911).

Excæcaria orientalis PAX et K. HOFFM. in Pfl.-reich, Euphorb.-Gelon. p. 160 (1912).

Excæcaria crenulata HAYATA in Journ. Coll. Sc. Tōkyō XX. p. 60.

Excæcaria Kawakamii HAYATA n. n. = *Excæcaria formosana* HAYATA et KAWAKAMI n. sp. in Sched. (non HAYATA). Frutex? Rami apice dense foliati. Folia alterna coriacea obovato-lanceolata vel obovato-elliptica $11\frac{1}{2}$ cm. longa 3 cm. lata apice obtusa deorsum gradatim cuneatimque angustata ad extremitatem subito attenuata ad petiolum attenuata margine integerrima desuper revoluto-recurvata utraque pagine glaberrima, costa supra tenuiter subtus prominente elevata, venis primariis utraque pagine tenuiter elevatis subtransversis rectis vel irregulariter subramosis, supra nitida subtus pallidiora, petiolis $1\frac{1}{2}$ cm. longis complanatis. Spicæ ad apicem ramorum fasciculatæ filiformes erectæ 10 cm. longæ unisexuales vel bisexuales generaliter sursum fl. ♂, deorsum fl. ♀ gerentes. Fl. ♂: basi 1-bracteati, bracteis late rotundatis $1\frac{1}{2}$ mm. latis $1\frac{1}{3}$ mm. longis apice breve cuspidatis crassiusculis margine erosioni basi glandula 2 instructis, pedicellis $\frac{1}{2}$ mm. longis incrassatis glabris. Sepala 3 oblongo-triangularia $1\frac{1}{3}$ mm. longa margine paucæ denticulata apice attenuato-cuspidata. Stamina 3, filamentis a basi divaricatis \pm continuis 1 mm. longis glabris, antheris reniformibus 1 mm. latis $\frac{1}{2}$ mm. longis apice breve apiculatis. Fl. ♀: basi 1-bracteati, bracteis latissimis $1\frac{1}{3}$ mm. latis $\frac{1}{2}$ mm. longis apice medio mucronatis, pedicellis 1 mm. longis incrassatis.

Sepala cordato-rotundata $1\frac{1}{2}$ mm. longa totiusque lata apice triangulati-acuta mucronata paucem denticulata vel mucronibus ciliiformibus 1-2 utroque latere margine instructa basi utroque latere glandulis instructa. Ovarium obovoidum $1\frac{1}{2}$ mm. longum apice ad stylum crassum abeuns, stylo 3-fido, segmentis incrassatis patentibus recurvatis.

HAB. Kwashōtō, leg. G. NAKAHARA, Feb. 1906, Typus! (No. 948). Kōtōshō, leg. U. MORI (No. 2476).

Near *Exocarica philippinensis* MERRILL., but differs from it by the quite obtuse leaves.

Urticaceæ.

Ulmus LINN.

Ulmus Uyematsui HAYATA sp. nov. (Tab. XXXII.) Arbor? Folia elliptica vel oblonga \pm obliqua 10 cm. longa $4\frac{1}{2}$ cm. lata apice cuspidata, (cuspidibus $1\frac{1}{2}$ cm. longis acuminatis), basi oblique obtusa ad extremitatem \pm cordata chartacea supra parcissime subtus densiuscule pubescentia margine tenuiter duplicato-serrulata, costis venisque supra tenuiter impressis subtus distinete elevatis, venis rectis mediis angulo 40° a costa egressis simplicibus vel prope apicem furcatis, ad axillas inter costam et venas dense pubescentia, venuulis secundariis inconspicuis inter venas primarias transverse minuteque reticulatis, petiolis brevissimis 4 mm. longis. Racemi axillares breves 1 cm. longi dense florati, rhachidibus pedicellisque breve dense pubescentibus, pedicellis ternatim fasciculatis, sub fasciculis singulis bractea una instructis, bracteis oblongis 5-6 mm. longis scariosis sursum ciliolatis cæterum glabris, pedicellis 6 mm. longis ad medium articulatis. Calyx campanulatus 3 mm. longus apice totiusque latus sursum 5-6 lobatus, lobis obovato-rotundatis 1 mm. longis totiusque latis apice rotundatis margine ciliatis cæterum glabris. Fructus compressus siccus oblique obovatus ala undique cinctus, cum alis 1 cm. longus totiuque latus, alis latis membranaceis radiatim reticulato-venosis a basi stipitis usque ad apicem ramorum styli extensis, stipitibus 2 mm. longis; pericarpio chartaceo. Semen sub apice affixum pendulum plano-com-

pressum; albumen 0; embryo rectus, cotyledonibus planis aequalibus, radicula parva supra.

HAB. Mt. Arisan, leg. K. UYEMATSU, Mart. 1913.

Near *U. castaneifolia* HEMSL.; but differs from that by the much thinner leaves without any particular beards on the axils of the primary lateral veins.

Elatostema FORST.

Elatostema edule C. B. ROBINSON, in Philip. Journ. Sci. (1910) p. 531.

HAB. Kōtōshō.

DISTRIB. Batanes islands.

Leucosyke ZOLL. MOR.

Leucosyke quadrinervia C. B. ROBINSON in Philip. Journ. Scie. (1911) p. 29.

Determined by Mr. T. KAWAKAMI at Manila in his trip to the Philippines.

Cupuliferæ.

Carpinus LINN.

Carpinus Kawakamii HAYATA (Tab. XXXIII.-B, et Fig. 24.) Rami in exsiccato fusco-purpurascentes lenticellis minutis notati. Alabastrum foliorum oblongo-ovoideum \pm 4-angulatum, perulis plurimis, extimis minimis, mediocribus ovato-oblongis castaneis 4 mm. longis $2\frac{1}{2}$ mm. latis obtusis ovatis concavis, intimis \pm minoribus. Folia oblonga vel lanceolato-ovata apice acuminata basi obtusa vel leviter obtuso-cordata usque ad 7 cm. longa $2\frac{1}{2}$ cm. lata margine supra basin usque ad apicem duplikato-serrata sed ad basin non serrata, venis lateralibus primariis utroque latere 10-12 rectis prope apicem serrarum ascendento-recurvis ad apicem serrarum primariarum attingentibus, supra distinete subtus obscure reticulata, costis et venis supra non elevatis barbis longiusculis parce pubescentibus, subtus prominentibus barbis longiusculis parce obtectis, utraque pagine (exceptis costis venisque) glabra, venis primariis lateralibus a costa angulo 40° divaricatis, chartacea, petiolis circ. 9 mm. longis supra longe adpresso-barbatis subtus glabratiss.

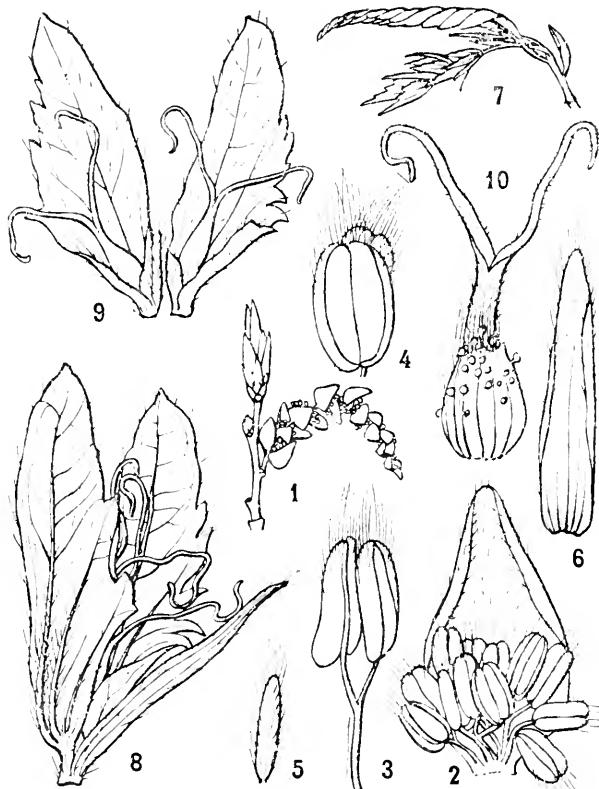


Fig. 24.

Carpinus Karakamii HAYATA. 1, male inflorescence; 2, a male flower; 3, 4, stamens; 7, a female inflorescence; 8, a pair of female flowers; 9, the same, expanded; 10, a female flower, bracts taken off. Fig. 1, and 7 natural size; others are more or less magnified.

Spicæ laxifloræ, fructiferae 4 cm. longæ, fructibus laxissime dispositis, bracteis semi-ovatis 18 mm. longis 7 mm. latis valde obliquis, (dimidio $1\frac{1}{2}$ mm. lato latere integro, dimidio 5 mm. lato, venis primariis lateralibus 3), venuis utraque pagine prominente reticulatis, extus ad costas et venas pilis longis dense, intus parceissime pubescentibus, basi non lobatis concavis fructus foventibus. Fructus complanato-ovatus 4 mm. longus 3 mm. latus apice obtuso-apiculatus basi rotundatus utraque facie 3-striato-costatus apicem versus verrucoso-resinoso-punctatus apicem versus pubescens.

HAB. Monte Morrison, Oct. 1907, (No. 1998.)

Near *C. faginea* LINDL.; but differs from it by the duplicitely serrate leaves.

Carpinus minutiserrata HAYATA sp. nov. (Tab. XXXIII.-A.) Rami et ramuli in exsiccato fusco-purpurascentes vel hac atque illae cinerascentes, lenticellis minutis rotundatis notati. Folia oblongo-ovata apice acuminata sed ad summum obtusa basi obtusa leviter cordata usque ad 6 cm. longa $2\frac{1}{2}$ cm. lata margine supra basin usque ad apicem tenuiter vel tenuissime duplicito-serrulata, venis lateralibus primariis 15-17 angulo 40° a costa divaricatis rectis versus apicem ascendento-recurvis ad apicem serrarum primariarum attingentibus, supra ad costas barbis longiusculis parce adpreso-que obiecta cæterum glabra, venis secundariis elegante elevato-reticulatis, costis et venis non elevatis, subtus ad costas et venas primarias prominentes barbis longiusculis parce obiecta cæterum glabra, venis secundariis elevato-reticulatis, petiolis 7 mm. longis teretibus subglabris vel parce pubescentibus. Racemi fructiferi 3-4 cm. longi subdescendentis laxe fructiferi, fructibus ad nodos geminis, geminis alternis 4 mm. a se remotis, partibus inferioribus non fructiferis $1\frac{1}{2}$ cm. longis rhachidibus tenuissime pubescentibus, bracteis semi-angulato-ovatis valde obliquis 13 mm. longis 6-7 mm. latis basi auriculato-decurrentibus pedicellum per partes amplectans et fructus foventibus utraque elevato-reticulatis intus ad nervos parcissime hirsutis cæterum glabris, extus ad nervos et ad partem auricalatam dense hirsutis cæterum glabris, semi-angulari-ovatis valde obliquis, dimidio 5 mm. lato subduplicato-serrato, (serris $1\frac{1}{2}$ mm. latis $\frac{1}{2}$ mm. longis apice leviter callosis) a basi nervos 3 emittenti, dimidio $1\frac{1}{3}$ mm. lato serris 1 vel 2 margine instructo, ad nervos minute parceque resinoso-punctatis. Achænum globoso-ovatum 3 mm. longum $2\frac{2}{3}$ mm. latum complanatum utraque facie 5-costatum superiore resinoso-verrucoso-punctatum apice parce pubescens apiculatum interdum stylis duobus persistentibus coronatum, inferiore glabrum.

HAB. Tandaisha, leg. U. MORI, Aprili. 1910.

Closely allied to *C. Seemeniana* DIELS; but differs from that by the thinner and smaller leaves with smaller serration, and the smaller bracts with auriculate decurrent base.

Corylus LINN.***Corylus rostrata* AIT. var.?**

HAB. Formosa: loco non indicato.

Near *C. rostrata* AIT. var. *Sieboldiana* Mx. but differs from it by the much shallower dentation of the leaves. Neither fruit nor flower, exact identification is impossible.

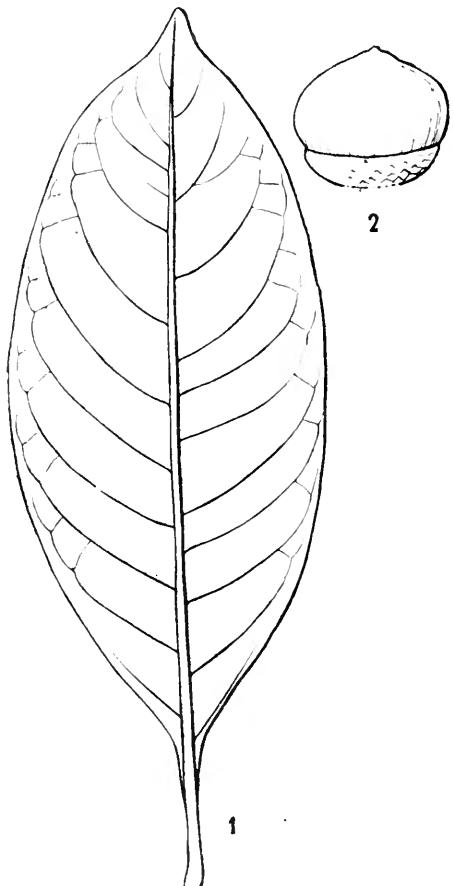
Quercus LINN.

Fig. 25.

Quercus arisanensis HAYATA. 1, a leaf; 2, a fruit. Natural size.

***Quercus arisanensis* HAYATA**
sp. nov. *Pasania arisanensis* HAYATA
in Herb. Taihoku. Folia tenuiter
coriacea oblonga usque ad 10 cm.
longa 4 cm. lata apice breve cuspido-
acuta ad summum obtusa basi
acuta ad extremitatem angustissime
attenuata ad petiolum subalatum
abeuntia utraque glabra subtus
opaca supra nitida, costis et venis
supra tenuiter subtus distincte
elevatis, venis lateralibus primariis
tenuissimis utroque latere costæ 10-
12, venis mediocribus basi a costa
angulo 60° egressis arcuatis, venis
secundariis reticulatis margine in
tegerrima, petiolis 2 cm. longis sub-
complanatis apice subalatis basi
incrassatis. Spicæ fructiferæ 7 cm.
longæ validiusculæ, fructibus aggregatim
spicatim dispositis. Cupula
patelliformis 7 mm. alta 17 mm. in
diametro, lepidibus multi-seriatim dis-
positis, mediocribus late triangulari-

bus apice cuspidatis 2 mm. latis extus leviter adpresso tomentosa intus tenuiter adpresso pubescens, cicatricibus glandum 8 mm. in diametro elevatis. Glans valde depresso-globosa 12 mm. longa 20 mm. in diametro, cicatribus valde impressis 8 mm. in diametro.

HAB. Arisan, leg. B. HAYATA et S. SASAKI, Jan. 1912.

Near *Q. brevicaudata*, but differs from it by the shortly acute less coriaceous leaves with reticulated second veins.

Quercus (*Cyclobalanopsis*) **Blakei** SKAN, in HOOK. Ic. Pl. t. 2662.

HAB. Hainan, leg. N. KONISHI, Juni. 1909.

DISTRIB. China: New British territory on the mainland opposite Hongkong.

Quercus castanopsisifolia HAYATA sp. nov. (Fig. 26). *Pasania castanopsisifolia* HAYATA in sched. Herb. Taihoku. Rami novelli fuscentes glaucescentes. Folia lanceolato-oblonga vel elongato-oblonga 25 cm. longa 7-8 cm. lata apice caudato-acuminata vel acuminata basi cuneata margine repanda chartacea utraque opaca, subtus pallidissima vel cinerascentia, venis lateralibus primariis 13-15 angulo 60°-50° a costa egressis, supra costis et venis planis non elevatis subtus prominente elevatis, subtus pagine tenuissime minuteque lepidota, petiolis brevioribus 1-2 cm. longis. Fructus spicati. Involucrum fructiferum truncato-globosum solitarium vel 2-3-connatum subglobosum longius quam latius 3½ cm. longum 3 cm. latum vel latius glandem perfecte includens apice truncatum depresso-foveolatum basi rotundatum intus glabrum extus bracteis accrescentibus spiraliter dense imbricatim instructum, bracteis tuberculiformibus adnatis subtriangularibus ± apiculatis. Glans globosa truncata truncato-depressa ad centrum apiculata, involucro perpetue inclusa.

HAB. Arisan, leg. T. UYEMATSU, Sept. 1912.

Near *Q. lepidocarpa* HAYATA, but differs from it by the much longer oblongo-lanceolate leaves which are much thinner and minutely lepidote.

Quercus Cornea LOUR. (FORBES et HEMSL. Ind. Fl. Sin. II. p. 510), var. **Konishii** HAYATA n. v. *Pasania Cornea* LOUR. var. *Konishii* HAYATA (Herb.

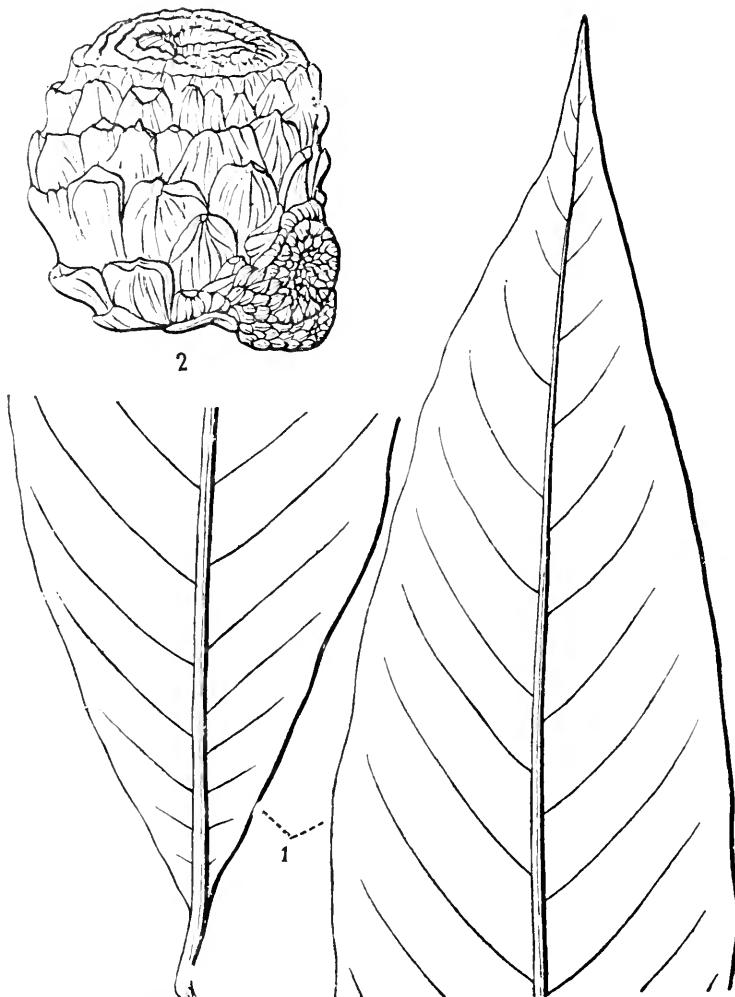


Fig. 26.

Quercus castanopsisifolia HAYATA. 1, a leaf; 2, a fruit. Natural size.

Taihoku). Rami et ramuli recti \pm hirsuti lenticellis minutis notati, cortice longitudinaliter fisso soluto. Folia obovato-oblonga vel obovato-oblanceolata apice cuspidato-caudata ad summum obtusa basi obtusa vel cuneata usque ad 20 cm. longa 7 cm. lata superiore latissima utraque pagine glabra, costis et venis supra impressis subtus prominente elevatis, supra ad costas leviter hirsuta subtus parce hirsuta ad axillas venarum hirsuta, venis lateralibus primariis

utroque latere costæ 15–16 \pm arcuatis, chartacea, petiolis usque ad 3 cm. longis ad basin incrassatis, stipulis caducissimis 6 mm. longis lanceolatis. Spicæ fructiferæ in speciminiibus nostris erectæ 10 cm. longæ, ad nodos flores 3–natim vel 4–natim gerentes sed abortu ad nodos fructus unum gerentes. Cupula cupuliformis 17 mm. alta 2½ cm. in diametro depresso-dense-hirsuta, lepidibus cuspidatis multi-seriatim instructis, lepidibus inferioribus majoribus superioribus minoribus. Glans hemisphaerica apice truncata leviter convexa brevissime tomentosa ad centrum apiculata, apice libera, cæterum cupula inclusa.

HAB. Hainan, leg. N. KONISHI, 1909, Juni. (Fr. et Fl.).

I conjects that this is the same as a plant mentioned by Mr. SKAN in the above referred work as "Hainan (B. C. HENRY, 65!)." As is shown by the same author the Hainan specimen differs from the type in having broader and thinner leaves. It may be regarded as a variety of the same.

DISTRIB. Type: Tonquin, Cochinchina, Borneo and Java.

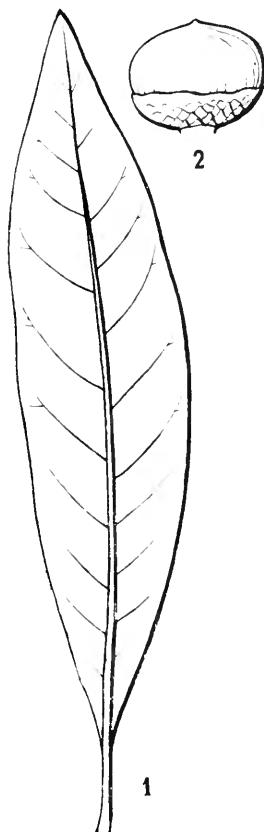


Fig. 27.

Quercus dodoniæfolia HAYATA.
1, a leaf; 2, a fruit. Natural size.

Quercus dodoniæfolia HAYATA sp. nov.
(Fig. 27). *Pasania dodoniæfolia* HAYATA Herb. Taihoku. Rami recti, cortice cinerascenti longitudinaliter fisso non lenticellato parce strigilloso, pilis horizontaliter patentibus. Folia valde coriacea linear-lanceolata vel oblongo-lanceolata 8–10 cm. longa 1½–2 cm. lata apice obtusa basi cuneato-attenuata supra nitida subtus pallidissima margine integerrima \pm recurvata, supra costa \pm impressa subtus elevata, venis lateralibus \pm impressis, subtus gracillimis, petiolis 11 mm. longis subalatis supra planis a basi \pm incrassatis. Cupula sessilis subplana 15 mm. in diametro extus adpresso tenuiter tomentosa (squamis latissimis apice latis truncatis ad centrum apici breve

euspidatis multiseriatis) intus sericeo-pubescent, cicatricibus valde elevatis, 8 mm. in diametro. Glans depresso-globosa valde depressa $1\frac{1}{2}$ em. in diametro 1 em. longa apice ad centrum \pm nueronata.

HAB. Shinsuiye, leg. S. NAKAI, Dec. 7, 1912.

Near *Q. Noiaderum* HANCE; but differs from it by the shape of the cup and glans.

Quercus hypophæa HAYATA sp. nov. (Fig. 28); *Pasania hypophæa* HAYATA in Sehid. Herb. Taihoku. Ramuli rugosi lenticellis minutis notati superiore tenuiter depresso-tomentella. Folia coriacea oblongo-lanceolata vel ovato-lanceolata 7-8 cm. longa 20-25 mm. lata apice acuminata basi obtusa supra glabra nitida subtus dense adpresso-fulvo-tomentella margine subintegra, costis supra tenuiter impressis subtus elevatis, venis lateralibus tenuissimis non conspicuis utrinque subplanis vel subtus leviter elevatis, petiolis $1\frac{1}{2}$ cm. longis dense adpresso-tomentellis intus sulcatis basi non incrassatis. Cupula late patelliformis ad orem leviter contracta 16 mm. in diametro 6 mm. alta, extus adpresso dense pubescent, (annulis 9 basi 2 mm. a se remotis, superiore proximatis $\frac{1}{2}$ mm. a se remotis), intus fulvo-sericeo-pubescent, cicatricibus planis. Glans depresso-ovoidea 13 mm. longa 12 mm. lata apice depressa ad centrum apiculata basi rotundata, (cicatricibus elevatis 7 mm. in diametro), supra cicatrices subito contracta, facie sericeo-pubescent castanea.

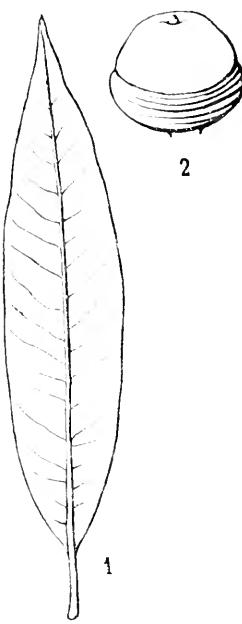


Fig. 28.

Quercus hypophæa HAYATA. 1, a leaf; 2, a fruit. Natural size.

HAB. Shinsuiye, Dec. 8, 1912, leg. S. NAKAI.

Quercus longicaudata HAYATA sp. nov. (Fig. 29); *Pasania longicaudata* HAYATA in Sehid. Herb. Taihoku. Rami rugosi lenticellis minutis notati. Folia lanceolata coriacea 9 cm. longa $1\frac{1}{2}$ em. lata apice linearis-attenuata vel

longissime caudata basi obtusa margine subintegra apice \pm falcata vel recta margine \pm recurva, costis supratenuiter impressis subtus prominentibus, venis lateralibus primariis tenuissimis supra non visis subtus tenuissime elevatis, supra glabra subtus adpresso lepidota. Spicæ φ axillares erectæ 5 cm. longæ. Fructus non visi.

HAB. Mt. Daibu, leg. S. NAKAI, Dec. 21, 1912.

Near *Q. cuspidata*, but differs from it in having subentire lanceolate leaves with long linear tails.

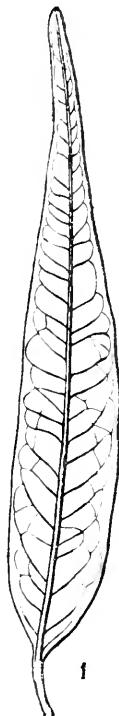


Fig. 29.

Quercus longicaudata HAYATA, 1, a leaf. Natural size.

Quercus (Pasania) Naiadarum HANCE in Journ. Bot. (1884) p. 227.

HAB. Hainan, leg. N. KONISHI, Juni. 1909.

The specimen lacks fruits. As far as is concerned the flowering specimen, our plant is perhaps identical with the named species.

Quercus Nariakii HAYATA sp. nov. (Fig. 30); *Pasania Nariakii* HAYATA in Schid. Herb. Taihoku. Rami et ramuli

brevisse tomentosi lenticellis notati. Folia chartaceo-coriacea vel coriacea obovato-oblonga usque 15 cm. longa 5 cm. lata apice breve cuspidato-caudata ad summum obtusa basi acuta cuneata margine integra utraque pagine glabra subtus glaucescentia, costis et venis supra subplanis subtus prominentibus, venis lateralibus primariis tenuibus utroque latere costæ 15-12, iis mediocribus a costa angulo 45° egressis, petiolis brevissimis incrassatis 7 mm. longis subtus rugosis. Spicæ foemineæ pauci-ramosæ vel simplices quasi-terminales 7-8 cm. longæ, rhachidibus validis fusco-tomentosis, floribus 5-6-aggregatis, bracteis multi-seriatis obtectis. Fructus ad rhachiu valde incrassatam validissimam aggregatim spicatum dispositi. Cupula sessilis turbinata 13 mm. longa 15 mm. lata (ore subclauso 1 em. in diametro), glandem semi-includens, lepidibus valde adpressis late rhomboideis apice breve cuspidatis, cuspidibus liberis, lepidibus in magnitudine mutabilibus, inferioribus majoribus 4-5 mm.

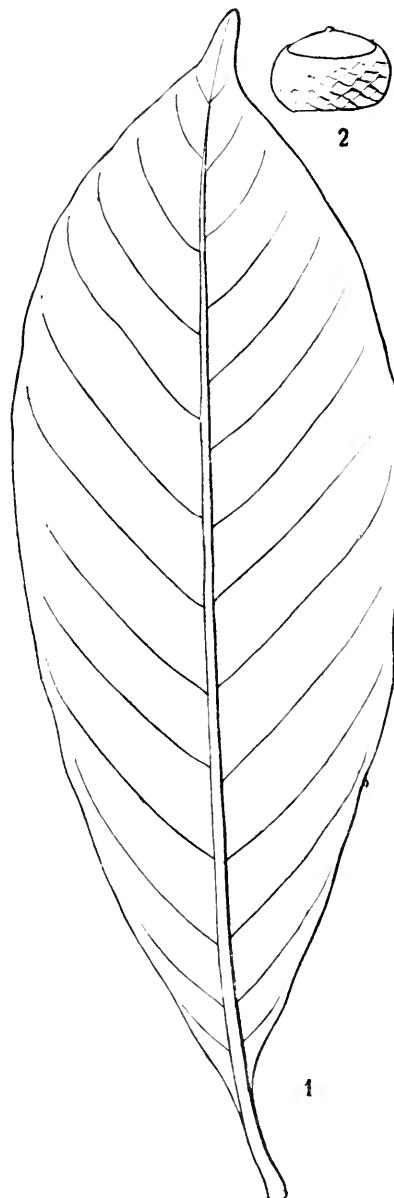


Fig. 30.

Quercus Nariakii HAYATA. 1, a leaf; 2, a fruit. Natural size.

latis, mediocribus 4 mm. latis, superioribus minoribus $1\frac{1}{2}$ mm. latis. Glans (præmatura?) depresso-hemisphærica 12 mm. lata 7 mm. longa castaneo-glabra.

HAB. Hainan, leg. N. KONISHI, Juni. 1909.

Near *Quercus spicata*. Owing to the lack of a mature cone, the exact comparison is not possible.

Quercus subreticulata HAYATA sp. nov. (Fig. 31); *Pasania subreticulata* HAYATA in Schid. Herb. Taihoku. Rami fusco-cinerascentes

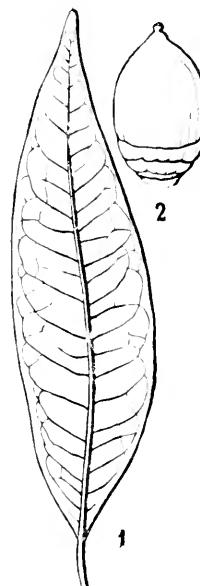


Fig. 31.

Quercus subreticulata HAYATA. 1, a leaf; 2, a fruit. Natural size.

glabri lenticellis globosis minutis notati, subrugosi. Folia lanceolata vel oblongo-lanceolata 8 cm. longa 23–25 mm. lata apice attenuato-obtusa vel obtusa basi obtusa vel acuta integra coriacea ± recurvato-plicata supra nitida utraque pagine glabra, costis supra planis subtus elevatis, venis lateralibus tenuibus, utraque pagine minute et distinete reticulata, petiolis 7 mm. longis intus planis subalatis basi ± incrassatis nigris antibus. Spicæ fructiferae erectæ, fructibus ad nodos fasciculatis maturo geminatis vel solitariis basi fructibus abortivis instructis. Cupula sessilis late obconico-patelliformis 4–5 mm. alta 1 cm. in diametro extus tenuiter adpresso tomentosa, (lepidibus connatis annulariter dispositis, annulis remote late dentatis, annulis inferioribus 1–2 mm. a se remotis, superioribus proximatum dispositis), intus sericeo-pubescentia, cicatricibus elevatis. Glans ovoidea apice obtusa apiculata basi rotundata 18 mm. longa 12 mm. lata, cicatricibus minoribus 4 mm. in diametro alte impressis, facie nitida fulva.

HAB. Shinsuiye, leg. S. NAKAI, Dec. 1912.

Quercus taichuensis HAYATA (Fig. 32) Mater. Fl. Formos. p. 196.

Quercus tomentosicupula HAYATA sp. nov.

(Fig. 33); = *Cyclobalanopsis tomentosicupula* HAYATA in Schid. Herb. Taihoku. Rami validiuseuli, exsiccato fuscentes, lenticellis minutis notati rugosi. Folia valde coriacea oblongo-lanceolata 9–10 cm. longa 3 cm. lata apice breve acuminata ad summum obtusa basi acuta in exsiccato utraque pagine opaca subtus pallido-glaucousentia margine medio sursum remote paucis serrata, (serris brevissimis a se 12 mm. remotis), costis et venis supra planis subtus prominentibus, venis lateralibus primariis tenuissimis utroque latere costæ 8–9 mediocribus a costa angulo 45° egressis subrectis vel leviter arcuatis apice ad apicem serræ attingentibus, subtus pagine ad costas parcissime hirsuta, petiolis 1½ cm. longis semi-teretibus leviter tomentosis vel subglabratibus. Cupula sessilis late campanulata ore expansa 13 mm.

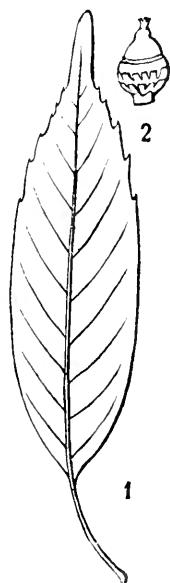


Fig. 32.

Quercus taichuensis HAYATA. 1, a leaf; 2, a fruit. Natural size.

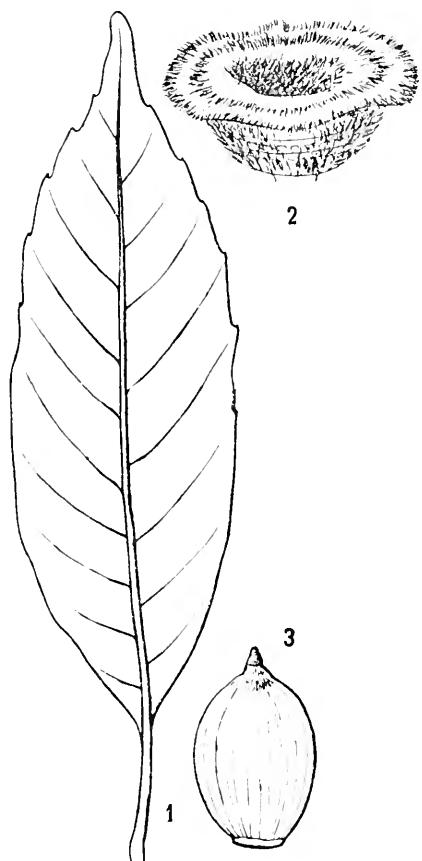


Fig. 33.

Quercus tomentosicupula HAYATA. 1, a leaf; 2, a cupula; 3, a glans. Natural size.

Folia coriacea utraque opaca subtus glauco-cinerascentia ovato-oblonga 8-10 cm. longa 26 mm. lata apice acuminata ad summum obtusa, (acuminibus \pm falcatis vel rectis), basi acuta ad basin subito attenuata, costis et venis supra planis subtus distinete elevatis, venis lateralibus primariis utroque latere costae 7-8-9 mediocribus a costa angulo 40° egressis, venis secundariis non conspicuis, petiolis 2 cm. longis semi-teretibus basi \pm incrassatis. Fructus ad spicam valde incrassatam aggregatim dispositi. Cupula

alta $2\frac{1}{2}$ -3 cm. in diametro basi rotundata intraque pagine dense fulvotomentosa, (pilis longis), extus 9-10 annulis concentricis instructa, annulis inferioribus obtuse dentatis, superioribus integris. Glans ellipsoidea $2\frac{1}{2}$ cm. longa $1\frac{1}{2}$ cm. lata apice acuto-apiculata basi rotundata, cicatricibus minoribus 7 mm. in diametro, apice breve tomentosa ceterum glabra.

HAB. Formosa: Loco non indicato, leg. S. NAKAI.

Near *Q. Edithae* SKAN (HOOK. Ic. Pl. t. 2661), but differs from it by the much smaller acorns with broad campanulate cups. Also near *Q. pachyloma* SEEM. from which our new plant is distinguishable by the glabrous leaves and much larger cups.

Quercus rhombocarpa HAYATA
sp. nov. (Fig. 34); *Pasania rhomboarpa* HAYATA in Schid. Herb. Taihoku. Rami et ramuli recti in exsiccatu atro-purpurascentes glabri, lenticellis minutissimis, longitudinaliter rugosi.

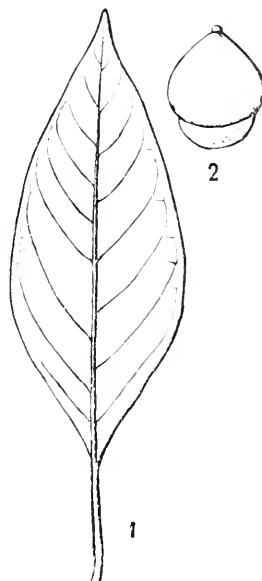


Fig. 34.

Quercus rhombocarpa HAYATA.
1, a leaf; 2, a fruit. Natural size.

patolliformis vel cupuliformis 8 mm. in diametro 5 mm. alta intus pubescens, lepidibus triangularibus adpressis apice \pm breve cuspidatis, medio cribus 1 mm. latis, cicatricibus glandum elevatis 4-5 mm. in diametro. Glans glabra \pm depresso-globoso-turbinata apice 13 mm. in diametro 12 mm. longa apice acuto-apiculata basi truncata, cicatricibus minoribus 5 mm. in diametro valde impressis.

HAB. Akō: Buisan, leg. T. KAWAKAMI et S. SASAKI, 1910, Mart.

Near *Q. toitoensis* HAYATA, but differs from that by the turbinate glans, and by the shape of the cup.

Quercus uraiana HAYATA Mater. Fl. Formos. p. 299 *Pasanis uraiana* HAYATA in Schid. Herb. Taihoku. Descriptio auctata. Amenta ♀ et ♂ versus apicem ramulorum paniculatim mixtim dispositi, amentis ♂ inferioribus patentibus \pm recurvato-descendentibus 3 cm. longis, amentis ♀ superioribus 3 cm. longis patentibus recurvato-descendentibus, bracteis singulis sub amento utriusque sexus sitis, bracteis caducissimis semi-amplexicaulibus $4\frac{1}{2}$ mm. longis $4\frac{1}{2}$ mm. latis apice obtusis margine denso barbato-ciliatis, rhaehidibus \pm tomentosis, floribus singulis bractea una bracteolis duobus instrutis, bracteis 1 mm. latis latioribus quam longioribus margine laciniatis, bracteolis minoribus bractea conformibus. Fl. ♂: non aggregati, segmentis perianthii late oblongis $1\frac{1}{2}$ mm. longis extus glabris margine barbato-ciliatis intus dense barbatis. Stamina circ. 10, filamentis glabris, antheris cordatis vix apiculatis. Rudimentum ovarii dense barbatum. Fl. ♀: non aggregati stigmatibus digitiformibus.

HAB. In Uraisha: Shinkō, leg. U. MORI, 1908, Feb. (No. 5081.)

Castanopsis SPACH.

Castanopsis brachyacantha HAYATA sp. nov. Ramuli in exsiccato glabri fusco-einerascentes, lenticellis minutis notati. Folia coriacea in exsiccato pallido-fulvescentia utraque glabra ovato-lanceolata usque ad 7 cm. longa $2\frac{1}{2}$ cm. lata apice acuminata ad summum obtusa \pm falcata vel recta, basi obliqua basi latere angustiore acuta, latere latiore rotundata, margine integra vel medio sursum obscure remoteque serrata, serris brevissimis a se

12 mm. remotis, costis et venis supra planis subtus tenuiter elevatis, venis lateralibus tenuissimis utroque latere costae 9-8 prope marginem evanescentibus, supra nitida infra non opaca, petiolis brevioribus 6-7 mm. longis complanatis. Alabastrum foliorum oblongum apice obtusum complanatum, perulis pluriis obtectum, perulis 2-seriatim imbricatim dispositis in formi variabilibus apice barbatis margine ciliolatis facie glabris. Fructus spicati sessiles. Involucrum fructiferum spinosum ovoido-conicum cum spinis 13 mm. longum totiusque latum extus adpresso pubescens spinis simplicibus densiuscule obtectum, (spinis recto-falcatis acutis 3 mm. longis), intus adpresso sericeo-pubescentia. Glans solitaria

Castanopsis brachyacantha HAYATA. 1, a leaf; 2, a fruit; 3, a glans. Natural size.

globoso-pyramidalis 1 cm. longa totiusque lata, facie tenuissime adpresso pubescens, basi truncata, apice acuto-apiculata.

HAB. Nantōchō: Mt. Shojōdaisan, ad 6000 ped. alt., leg. S. KATŌ, 1910, Dec. (Fructus).

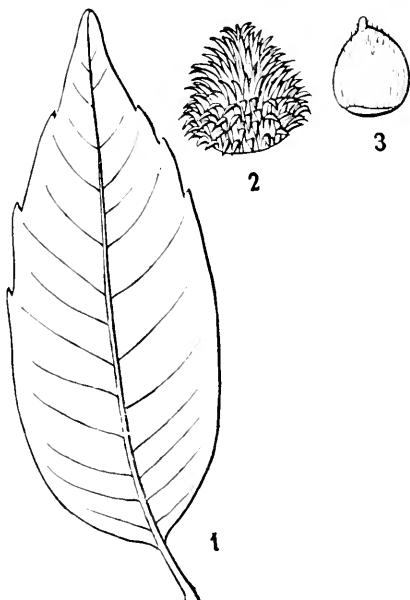


Fig. 35.

Castanopsis formosana HAYATA sp. nov. Rami et ramuli atro-rubro-purpurascentes hac at illac cinerascentes, lenticellis-rotundatis elevatis minutis notati. Folia tenuiter coriacea ovato-oblonga 8-9 cm. longa 3-3½ cm. lata apice acuminata basi acuta vel late cuneata supra basin usque ad apicem valde dentata, (dentibus in utroque latere 6-7, 1½-½ cm. a se remotis apice leviter incurvis acutis, sinibus inter dentes rotundato-obtusis), supra glabra subtus cinereo-glaucouscentia, costis et venis supra planis subtus distincte elevatis, venis primariis lateralibus utroque latere costæ 7-8, a costa angulo 45° egressis apice ad apicem dentum attingentibus tenuibus, petiolis glabris 13 mm. longis basi ± incrassatis. Spicæ florum ♂: ad apicem ramulorum terminales vel versus apicem axillares basi ramosæ, ramis longissimis elongatis erectis 10 cm. longis, floribus spicatim ad nodos 2-3 aggregatim dispositis, bracteis 3-4 ad basin florum aggregatorm dispositis. Perianthii segmenta 5 obovato-oblonga 1½ mm. longa extus parce intus dense longeque hirsuto-barbata, staminibus 9-10, filamentis filiformibus longe exsertis patentibus 4½ mm. longis parce hirsutis vel glabratris, antheris globosis ½ mm. in diametro. Spicæ fl. ♀ ignotæ. Fructus ad rhachidem incrassatam spicatim dispositi spinosi, in circumscriptione globosi 2 cm. in diametro, spinis teretibus usque 1 cm. longis 1½ mm. latis rectis breve tomentosis dense dispositis. Glans singularis acuta apiculata floccoso-tomentosa.

HAB. Hieranzaan, leg. T. KAWAKAMI et S. SASAKI, 1910, Feb. (Fl. et Fr.).

This is very near *C. tribuloides* var. *formosana* SKAN. It may perhaps be identical with SKAN's variety. But the present plant is so widely different from *C. tribuloides* that we are forced to regard it as specifically different from the named species.

Castanopsis subacuminata HAYATA sp. nov. *Castanopsis indica* HAYATA Fl. Mont. Formos. p. 204. Rami dense pubescentes. Folia ovato-acuminata apice acuminata 12 cm. longa 3½ cm. lata apice acuminata, basi acuta vel cuneata margine grosse leviterque serrata, (serris ascendentibus introrse recurvis a se 8 mm. remotis brevissimis 2 mm. longis latissimis apice mucronatis), margine inferiore parte cuneata integra supra glabra subtus dense brevissime pubescentia, costis et venis supra leviter impressis subtus

prominentibus, venis lateralibus utroque latere costæ circ. 15 rectis angulo 40° a costa divaricatis, ad apicem serrarum attingentibus, petiolis 1 cm. longis supra planis leviter sulcatis infra convexis pubescentibus. Spicæ ♂ paniculatae, ramis gracilibus circ. verticaliter erectis vel ascendentibus 10-15 cm. longis dense pubescentibus basi ad insertionem 1-bracteatis, bracteis ovato-triangularibus 4 mm. longis 3 mm. latis crassiusculis apice obtusis vel 2-dentatis vel emarginato-rotundatis basi ad insertionem truncatis non contractis utroque dense pubescentibus; bractea sub flore 1-3 una sita late rotundata acuta vel bi-cuspidata integra vel 2-loba, exteriore hirsuta, interiore glabra 1 mm. longa, bracteolis sub flore sitis $\frac{1}{2}$ mm. longis triangularibus acutis. Fl. ♂ in bractea singula 1-3, 1-2-bracteolati. Perianthium 6-7 partitum vel lobatum, lobis 3 exterioribus 3 interioribus, extus subglabris intus hirsutis vel longi-barbatis oblongis obtusis 1-1 $\frac{1}{2}$ mm. longis extus 1-costatis, costis latis elevatis. Stamina 15-20, filamentis filiformibus 2 $\frac{1}{2}$ mm. longis, antheris 2-orbicularibus, loculis distinctis. Rudimenta ovarii minuta barbata. Spicæ ♀. terminales vel axillares pauci-ramosæ vel simplices 20 cm. longæ, rhachidibus latere compressis. Fl. ♀ in bractea una solitarii 2-bracteati, bracteis triangularibus. Perianthium 6-lobum, ovarium semi-includens. Styli 3 erecti, ad apicem 1-foveolati vel impressi stigmatosi.

HAB. Kashimro, C. ŌWATARI, III. 1898.

The present plant was formerly referred to *C. indica*; but the plant is slightly different from the Indian species, as is seen from the specimen of the species collected by Mr. T. KAWAKAMI in Mungpoo at an elevation of 8000 ft. (Herb. Taihoku, Mungpoo 8000 ft. India. Jan. 26, 1912, Fl. leg. T. KAWAKAMI). The leaves of this new plant are ovately acuminate, broadest in the lower portion, while those of the Indian species are obovate, broadest in the upper portion.

Coniferæ.

Pinus LINN.

Pinus brevispica HAYATA sp. nov. (Tab. XXXIV). Arbour. Rami fusco-cineraceentes, cicatricibus prominentibus. Folia gemina 10–13 cm. longa acerosa acuta subtus cunaliulata, margine serrulata, utrinque stomatifera, rucurvo-luniformia in sectione, (sectione 750 μ lata 400 μ crassa, canalibus resiniferis centralibus superioribus inferioribus epidermide proximis, iis lateralibus in mesophyllis dispositis, canalibus principalibus in speciminibus nostris 4 interdum 6?; vaginæ 9–10 mm. longæ, squamis membranaceis fuseis margine albido-lacerato-fimbriatis demum deciduis. Gemmæ cylindraceæ apice obtusæ, perulis castaneis margine tenuibus triangulari-lanceolatis acuminatis margine laceratis, (laceris descendento-reflexis) 5 mm. longis basi 2 mm. latis. Flores masculini ad apicem ramorum quasicapitatum dispositi, pseudocapitulis quasi-terminalibus apertiente obvoideis 3–4 cm. longis 2½–3 cm. latis, toris capitulorum 1 cm. longis quam floribus in longitudine brevioribus vel interdum longioribus; vel flores ad partem basilarem virgulti brevis verticillatim lateraliterque dense dispositi. Pseudo-capitula basi bracteata, bracteis triangulari-lanceolatis 6 mm. longis basi 2½ mm. latis apice acutis castaneis margine tenuibus hyalinis laceratis introrse erecto-recurvis, floribus ad axillas bractearum fertilium singulis, supra basin infra medium stipitum florum bracteolatis, bracteolis 5–6 magnitudine variabilibus extimis et intimisque minoribus interioribus majoribus 2–5 mm. longis ovatis obtusis concavis castaneis margine hyalinis laceratis. Staminum columnæ (vel fl. ♂) cum staminibus cylindracea, cum stipite 1½ cm. longa 1½–2 mm. lata apice obtusa basi stipite 3 mm. longo instructa, staminibus circ. 50–70 circa rhachin spiraliter dispositis, antheris subsessilibus vel filamentis brevissimis instructis, (appendicibus connectivorum late rotundatis 1 mm. latis ⅔ mm. longis margine minute denticulatis, superioribus imbricatis vel eā leviter attingentibus, cum rhachidibus paralleliter sitis), loculis antherarum basi appendiculum connectivorum rhachide transversim sitis obovatis 1 mm. longis rima extrorsa longitudinaliter deliscentibus. Flores fœminei (vel strobili novelli) versus

apicem ramulorum lateraliter siti semper solitarii vel interdum oppositum gemini. Strobili laterales brevissime stipitati 4 cm. longi $2\frac{1}{2}$ cm. lati ovoidei; squamarum medioerum apophysa 9 mm. lata 5 mm. longa obscure quadrangularis, lineis 4 ad centrum convergentibus plus minus prominentibus notata antice rotundata, umbone depresso transversim rhomboideo 1 mm. lato ad centrum mucrone uno descendentem instructo. Semina obovoidea 5 mm. longa $2\frac{1}{2}$ mm. lata minute purpureo-punctata superne ala membranacea purpureo-striata late cultriformi munita, alis cum seminibus 14 mm. longis 4 mm. latis. Strobili post disseminationm conico-globosi $4\frac{1}{2}$ cm. longi totiusque lati basi latissimi, in sectione triangulares.

HAB. Formosa: in montibus altissimis, leg. U. MORI.

This is different from *P. taiwanensis* HAYATA in having much shorter male inflorescence, much thicker leaves, as can be seen in a section of the leaves, and in having conical-triangular cones after dissemination.

Pinus taiwanensis HAYATA Materials for a Fl. Formos. p. 307. Descriptio auctata. Flores masculini ad basin virgulti novelli spicatum dispositi, rhachidibus vel virgultis 3 cm. vel 5 cm. longis supra productis, partibus floriferis inferioribus 2-3 cm. longis, bracteis acuminato-lanceolatis 11 mm. longis basi latissimis 2-3 mm. longis castaneis margine hyalinis laceratis, bracteolis sub flore singulo 5-6 oblongis obtusis 6 mm. longis margine \pm laceratis. Staminum column (vel flos. ♂) oblongo-cylindracea 12 mm. longa cum staminibus 4 mm. lata brevissime stipitata, stipitibus 2 mm. longis; staminibus circ. 100 circa rhachin spiraliter dispositis, connectivorum appendicibus semi-globosis $1\frac{1}{3}$ mm. latis 1 mm. longis margine minute denticulatis imbricatis, antheris sessilibus cuneato-oblongis 1 mm. longis vel longioribus. Semina obovoidea apice obtusa basi acuta \pm complanata facie opaca rugulosa.

HAB. Mt. centralibus, leg. U. MORI 1910, Aprili.

Pinus Uyematsui HAYATA sp. nov. (Tab. XXXV.) Arbour; rami veteriores cinereo-fuseentes glabri pulvinis vix elevatis transverse oblongis intusque latere cicatricibus perularum minutarum instructis; rami novelli

cinereo-rubescentes, pulvinis elevatis; perulæ fasciculorum foliorum brevisimæ latissimæ, præterea bracteolæ 2-3 sitæ. Fasciculus foliorum basi 2-3 annulis instructus. Folia in quovis fasciculo quinque non vaginata, acerosa 6-7 cm. longa facie exteriore viridissima facie interiore glauco-albicantia, sed ad marginem et costam viridiora, ad marginem et costam minute serrulata, costa interiore prominenti, triangularia in sectione, ad costam euspidato-acuta. Canales resiniferi 2 arete sub epidermide latere exteriore dispositi, meristela rotundata in sectione. Gemma obovato-oblonga, perulis ovato-oblongo-triangularibus vel lanceolato-triangularibus. Strobili hornotini elliptici 2 em. longi 1 em. lati, (pedicellis 1½ em. longis) squamis medioeribus rhomboerotundatis 5-6 mm. longis 5 mm. latis apice rotundatis, bracteis sub squamæ late flabelliformibus late 2 mm. latis 1 mm. longis. Strobili annotini cylindrici 10 em. longi 2½ em. lati basi truncaleo-rotundati apice gradatim acuto-obtusi, squamis arete imbricatis margine tenuibus. Stroboli post disseminationem cylindrici 12 em. longi 4½ em. lati, squamis medioeribus obovato-cuneatis (apophysis sensim et leviter incrassatis late rhomboideis apice rotundatis basi acutis 1½ em. longis 2 em. latis), eretis vel leviter reflexis, umbone ad apicem apophysis sito transverse semi-rhomboideo 4 mm. lato 2 mm. longo brevissime apiculato. Semina (persimiliter præmatura) oblique ovata ± complanata basi cuneato acuta rotundata 8 mm. longa 4 mm. lata, alis cum seminibus semiovatis 22 mm. longis 6 mm. latis. Embryo cylindricus, cotyledonibus 8, ½ mm. longis.

HAB. Arisan, ad 7000 ped. alt., leg. U. UYEMATSU.

Here are seven species of 5-leaved pines in Japan and China, from which the present *Pinus* is quite different in having cylindrical long cones. The new species is the most near to *P. formosana* which is different from ours in having ovoidal cones. The scales of the cone of this species are much thinner than those of any other kind of pines.

Orchideæ.

Galeola LOUR.**Galeola altissima** REICHEB. ; MATSUM. Ind. Pl. Jap. II.-1. p. 246.

HAB. Biōritsu: Manapan. (Herb. Taihoku Museum.)

Owing to the imperfectness of the specimens, the determination is rather conjectural.

Scitamineæ.

Zingiber ADANS.**Zingiber Zerumbet** Rosc. ; FORBES et HEMSL. Ind. Fl. Sin. III. p. 70.

HAB. Cult. (Herb. Taihoku Museum).

Musa LINN.

Musa insularimontana HAYATA sp. nov. Caulis subcylindricus, caespitosus. Folia angustiora. Inflorescentia tenuis curvato-nutans, bracteis ovato-lanceolatis 7 cm. longis 3 cm. latis valde concavis fusco-rubescensibus concoloris. Flores 8 in singula bractea, 2 seriatim dispositi, sessiles. Fl. ♀: Perigonium cylindraceum latere fissum 3½ cm. longum apice 5-lobatum, lobis 3 exterioribus et 2 interioribus; lobis exterioribus 2 lateralibus oblongo-triangularibus 5 mm. longis 4 mm. latis apice obtusis dorso corniculatis, (cornibus triangularibus verticaliter compressis) margine integris tenuibus, lobo exteriore centrali ovato apice obtuso non corniculato 3½ mm. longo totiusque lato; lobis interioribus oblique ovatis, altro latere 4 mm. longis altro 3 mm. longis basi auriculato-cordatis apice obtusissimis margine tenuibus. Petala elliptico-obovata 1½ cm. longa 1 cm. lata apice truncata vel emarginata ad centrum breve cuspidata, (cuspidibus 1 mm. longis), basi obtusa contracta ad insertionem ½ mm. lata margine integra (excepte partem apicalem truncatam) apice irregulariter denticulata. Stamina 5 cum calyce æquilonga vel breviora 28 mm. longa, filamentis validiusculis 1 cm. longis,

antheris adnatis linearibus apice connectivis leviter productis obtusis; stylo columnari-filiformi cum staminibus æquilongo apice clavato. Fl. ♀ non visi. Rhachis teres 3 cm. in diametro sectionis dense pubescens. Fructus præmaturi inæqualiter tetragoni stipitati, stipitibus dense pubescentibus.

HAB. Kōtōshō: in montibus, leg. Y. TASHIRO, Aug. 1912.

Near *M. paradisiaca* which is distinguishable from our plant by its entire free tepal and glabrous rhachis; also near *M. flava* which differs by its broader bracts. This bears some resemblance to *M. celebica* which is however separable from our plant by the umbonate berry. Our plant is also near *M. Bakeri*, but differs from it by the distinct stalked fruits. Fruits of this new species are full of seeds, and therefore not eatable.

Musa textilis var. **Tashiroi** HAYATA n. v. Caulis, folia et inflorescentia ut typicæ. Bractea extus purpureo-fuscens intus coccinea (fide TASHIRO), ovato-elliptica 15 cm. longa valde concava, versus apicem inflorescentiæ obovata apice obtusissima basi subcuneata. Fl. ♂: Rhachis glabra; flores 8-clustati basi connati, supra ovarii rudimenta liberi. Rudimentum ovarii 1 cm. longum 3 gono-obconicum. Perigonium 4 cm. longum apice 5-lobatum, lobis 3 exterioribus et 2 interioribus; exterioribus 2 lateralibus apice dorso corniculatis triangularibus apice cucullatis, (cornibus 2-3 mm. longis reflexis), lobo exteriore centrali apice dorso corniculato, cornibus brevioribus verticaliter latis; lobis interioribus oblongis 4 mm. latis apice cucullatis dorso breve et tenuiter corniculatis. Petala lanceolato-oblunga 3 cm. longa 23 mm. lata apice truncato-emarginato-cuspidata vel apice brevissime 3-cuspidata, (cuspidibus lateralibus obtusis, centralibus acutis 1 mm. longis), margine sursum obscure tenuissime remotissime serrulata. Stamina 5 cum sepalis æquilonga 3½ cm. longa, filamentis subcrispatis ± complanatis 1½ cm. longis basi antherarum clavatim incrassatis, antheris linearibus, (loculis undulatis) apice obtuse apiculatis 2 cm. longis; stylo cum staminibus æquilongo columnari-filiformi, stigmate clavato densissime villoso. Fructus trigono-cylindracei recurvi glabri ∞-spermi 7-8 cm. longi 2 cm. in diametro sectionis apice breve rostrati (rostris 5 mm. longis) basi stipitati, stipitibus 1 cm. longis cum rostris brevissime pubescentibus. Semina ∞ nigra angulato-rotundato-disciformia 5 mm. in diametro, subnitida.

HAB. Kōtōshō, leg. T. TASHIRO, Aug. 1913; Kwashōtō, (fide TASHIRO).

Differs very slightly from the type in the more patent petioles, scarlet purple bracts, and in the young leaves which are usually reddish on the back.

Palmæ.

Pinanga Bl.

Pinanga Tashiroi HAYATA sp. nov. Truncus 6–7 ped. altus, rarius 14–15 ped. altus, 1.5–2 ped. in circumscriptione, basi apiceque urreolato-dilatatus, extus albo-cinereus rugosus, cicatricibus foliorum annularibus, inferioribus 10–15 cm. remotis, superioribus plus remotis. Folia terminalia: vagina 1 mm. longa amplexicaulis ferrugineo-fulva validissima, petiolo 60 cm. longo lamina circ. 2 m. longa circ. 1 m. lata, pinnata subchartacea paripinnata supra glabra viridissima nitida subtus pallidiora, pinnis alternis vel oppositis lanceolatis apice acuminatissimis 4–5 cm. latis basi 2 cm. latis, 2–3–4–nervatis, nervis supra plus elevatis subtus minus elevatis; subtus ad nervos tomentellis, pinnis superioribus latioribus apice laceratis, rhachidibus 5–6 mm. latis medio costatis, costis supra anguste elevatis subtus late elevatis, supra glabris subtus ± tomentellis, cum petiolis conformibus. Paniclea infra prope apicem trunci 3–5 pendulae 40 cm. longae ramosae, ramis circ. 30 simplicibus 25 cm. longis fructus spicatim gerentibus. Perianthii segmenta fructiferi 6, 3–mera late rotundata 5 mm. lata 4 mm. longa. Fructus ovoides apice conico-acuti basi obtusi 18 mm. longi 12 mm. lati coecinei 1–spermi. Embryo basilaris, albumen ruminans.

HAB. Kōtōshō, leg. Y. TASHIRO, Aug. 1912.

Very interesting palm. Through the courtesy of Mr. E. D. MERRILL, I have learnt that the palm is closely allied to the Philippine *Pinanga Barnesii* BECC. Our palm is, however, different from that species in its taller and thicker trunks, and in its smaller fruits. It was first, some years ago, discovered by Mr. Y. TASHIRO in the island of Kōtō (Botel Tobago). It grows in a dense forest in the central parts of the island on

an altitude of about 1000 ft. It extends sometimes over an elevation of 1800 ft. above the level of the sea, when the elevation is surrounded by the several mountain ranges. The palm is of rather small size. The trunk is usually 6-7 ft. high, and even the tallest does not exceed 15-16 ft. It is generally larger than that of *Areca Catechu*, attaining 1.6-2.2 ft. in circumference, urceolately swollen at both top and base. It is ashy-white, rugose; scars of leaves are annually arranged, and 3.3-5 inches distant at the basal parts of the trunks, but gradually remoter towards the top; sheath nearly 3 ft. long, iron-brown. Leaves terminal, (excepting vagina) 7-8 ft. long (including petioles), 3-4 ft. broad pinnate, deep green shining, petioles 2 ft. long. Panicles 3-4-5, hanging from the apical portions of the trunks, branched; branches nearly 30, 7-9 inch long, each bearing nearly 40 fruits. Fruits sessile deep scarlet.

Eriocaulææ.

Eriocaulon LINN.

***Eriocaulon* Merrilli RUHL.**

HAB. Formosa: Loco non indicato (Herb. Taihoku Museum.)

Determined by Mr. T. KAWAKAMI at Manila in his trip to the Philippines.

*On the systematic Position of *Mitragastemon*, as a
Genus representing a special Tribus of
the Rafflesiacæ.

By

B. HAYATA.

CONTANTS.

- I. Introduction.
- II. External Morphology of *Mitragastemon*, especially with regard to its systematic Position.
- III. Inner Morphology of *Mitragastemon*, especially with regards to its systematic Position.
 1. Anatomy of the intramatrical Tissue.
 2. Structure of the Peduncle.
- IV. Systematic Position of *Mitragastemon*.
- V. Résumé.
- VI. Literature consulted.

I. Introduction.

More than thirty years ago, there was recorded from Kiushiu (TASHIRO), a southern island of Japan, a flowering parasite of very peculiar character widely different from any other plant, whether parasitic or not, then known in Japan. The record of the parasite then given was an extremely imperfect one, with a very rough sketch of a specimen of a peduncle without any attaching organ, and apparently lacking one of the genital organs. For a long time, it did not come to the notice of any professional botanist, either

* An article in German on this same subject appeared in ENGL. Bot. Jahrb. LI. Heft.-1, pp. 164-176, T. I.

at home or abroad, until nearly five years ago, when another specimen also in a very imperfect state was found in Shikoku, another southern island of Japan. The plant was then first examined by T. MAKINO (MAKINO I., p. 326), who with some hesitation regarded it as a plant possibly referable to the Rafflesiaceæ. His opinion was based presumably on a consideration of only the external features of the plant, and not upon a careful examination of the morphological structure of the flowers, and certainly without studying its attaching organ or its anatomical character. It was considered by him to be a plant representing a new genus, and was then first named *Mitrastemon Yamamotoi* MK. Later on, towards the end of 1911, an exhaustive description of the plant, beautifully illustrated, was given by T. MAKINO in the Journal of the Tokyo Botanical Society. In this article he regarded the plant as representing a new family, the *Mitrastemonaceæ*, distinguishable from the Rafflesiaceæ by its having a gamophyllous cylindrical and truncate perianth, a mitriformed staminal column and a superior ovary. A little previously, i.e. in 1910, another plant much like the former was found in the southern part of the island of Formosa. This parasite, being far larger than the Japanese plant and differing slightly from the latter, was consequently described by me as a new species, *Mitrastemon Kawasakii* HY. (HAYATA I. p. 112). In my then description of this new parasite, I was merely following MAKINO, and did not in detail go into the systematic position of the plant. Later on, I became strongly of opinion that the plant belonged to the Rafflesiaceæ, and accordingly transferred it to that family (HAYATA II., p. II.).

As I have said above, *Mitrastemon* was first referred to the Rafflesiaceæ, then was considered to represent a new family, and even to be comparable to the Nepenthaceæ (MAKINO II., p. 252). Consequently, the systematic position of the plant has been much confused. In the present paper, it is my desire to make a few remarks about the systematic position of the parasite when considered from the point of a comparision of its morphological and anatomical characters with those of other families; and more especially from a deliberate consideration of the different characters which separate our parasite from all the plants at present referred to the Rafflesiaceæ, to decide

whether the said characters necessarily prevent it from being taken into the same family, or in other words whether the differences are such as separate genus from genus or family from family.

So far as I am aware, a discussion of this kind on *Mitrapetromon* has never been undertaken. Moreover, there is no work on the anatomy of the intramatrical tissue, the flower-peduncle, or the structure of the ovules, which collectively make up a group of characters which are as important as any other floral characters for the determination of a systematic position. In this paper, I shall first consider the morphology of the plant both external and internal, especially so far as is necessary for the present discussion and then in its bearings on the systematic position of the plant itself.

II. External Morphology of *Mitrapetromon*, especially with regard to its systematic Position.

*The plants are leafless, unbranching, single flowered parasites growing on exposed roots of *Quercus cuspidata*. Roots over 1 cm. in diameter frequently bear numbers of these plants. The volva is always in colony, separate, or confluent below, short, globose, erect, sessile, dark fulvous. Peduncles simple, thick, straight or sometimes slightly curved, terete or subcompressedly terete, smooth on surface, provided with scales. Scales opposite in 5 or 6 pairs, imbricate, decussate, concave, margin adnate to the peduncles at the base, forming tubes in the basal portions, where honey-like fluids are secreted in abundance.** Scales are more or less shining owing to a small quantity of a fluid secreted on the surface, especially when the flowers are in bloom. Flowers are always hermaphrodite and usually regular, but sometimes more or less didlinous, especially in the earlier stage of flower-development. Of the four primordial leaves which compose the perianth, the front and back ones are usually broader than the lateral pair. In many cases, they, in a

* The reader is requested to refer to the original description of *Mitrapetromon Yamamotoi* M.K. contributed by Mr. T. MAKINO to the *Tōkyō Bot. Mag.* XXV. p. 252, T. VII. and M. Kawasakii HAY. in the same journal, XXVI. p. 112.

** In the flowering season, this honey attracts large numbers of a bird resembling a Japanese white eye, (*Zosterops japonica* T. et Z.).

strict sense, lack the radial symmetry, as is the case with many flowers of the Rafflesiaceæ. They are solitary, terminal, subterete. The perianth-tube is hypogynous and firmly attached to the ovary. It is usually truncate or sometimes 4-lobed at the apex, seemingly like the perianth of *Pilostylis* and sometimes like that of *Apodanthes* (SOLMS-LAUBACH I., p. 12) but differs in being hypogynous. The perianth is 4-merous, as is seen in the very early stage of the flower-development, and also in fully developed flowers which have sometimes the perianth 4-lobed. The existence of this 4-lobed perianth in *Mitrastemon* escaped the attention of the previous authors who recorded it as having an entirely truncate tube without any lobe, which lobeless perianth they regarded as one of the peculiar characters separating the plant from the Rafflesiaceæ (HAYATA I., p. 112; MAKINO II., p. 253). Corolla none. Stamens deciduous, hypogynous, erect, connate into a cylindrical cap, entirely covering the gynæcium, as in *Pilostylis aethiopica* (LOTSY p. 881), filaments entirely connate into a broad tube, dehiscing vertically on one side. Anthers numerous connate into a broad belt-like cap which covers the stigma. Anther-cells, quite irregularly and closely arranged in many series on the above mentioned belt-like cap. They are separated by thin walls, and outer walls are especially very simple. A fibrous layer lacks entirely. They are very like those of *Pilostylis* (LOTSY p. 881, Fig. 612, 3, 4, 6). Connective-tips connate into a cap with a very small opening at the apex. Ovary, entirely superior, sessile, ovoid, one-celled, with parietal placentas, 9-13 in numbers, (or more in *M. Kawasakii* HAY). The ovary is much like that of *Apodanthes* (SOLMS-LAUBACH I., p. 12) in its structure, but differs from it in being superior. The placentas are lamelliformed, thick, fleshy. Style, crowning the top of the ovary and articulated to it, erect, short, very thick, conical. Stigma, semi-spherico-conical, umbonate at the top with an obscure groove on one side. In shape, the style and stigma are much like those the female flowers of *Pilostylis* and *Apodanthes* (SOLMS-LAUBACH I., p. 13). Ovules, minute, obovoid-ellipsoid, with a short or long funicle, anatropous; integument, composed of a single layer of cells, as is also the case with the nucellus. The structure of ovules are very much like to that of the Rafflesiaceæ more than that of any other parasitic plants (GOEBEL II., p. 368-369;

SOLMS-LAUBACH VI.). Fruit baccate, slightly larger than the ovary, and comparable to that of the Apodantheæ. In the case of a plant which was sent from its native locality, and kept growing in a pot in a green-house here in Tōkyō, I have observed that the style which at the base is jointed to the ovary is, when the fruit is fully ripe, separated by a slit along the articulation. Seeds minute and very numerous, with a hard reticulated testa like those of rafflesiaaceous plants.

III. Inner Morphology of *Mitrastemon*, especially with regards to its systematic Position.

1. Anatomy of the intramatrical Tissue.

The intramatrical tissue of the parasite in the host root is entirely of the kind generally called a "thallus" which, in its main parts, exists in the bast of the host root. It is a formless mass just under the peduncle of a flower in the bast and soon separates into a number of threads running right and left along the long axis of the host root; anastomosing with each other, and forming a network which completely surrounds the host-root in the middle layer of the bast and on the outer side of the cambium layer. Flower peduncles are generally found most profusely on roots 1 cm. or more in diameter. From each thread of the network-thallus a number of smaller threads much finer than the preceding are sent out perpendicular to it towards the center of the xylem. For convenience sake, I shall call a thallus-thread running horizontally along the long axis of the root in the bast-region a horizontal thread, and one running vertically towards the center of the xylem a vertical thread. The horizontal threads in the bast are composed, as is seen in a cross section of the host root, of rounded plasmatic cells in the periphery, but of elongated ones towards the center, and in most cases there are found near the center some tracheids with spiral markings. The peripheral plasmatic cells, it seems to me, are comparable to the phlōm of highly organized plants in their function, while the central somewhat elongated tracheidal cells resemble the xylem of the same in their function. Towards their ends, the threads, both vertical and horizontal,

become very much finer until at last the thread consists of a single row of cells, which is called by SOLMS-LAUBACH a mycerium-thread, on account of its resemblance to a fungus-hypha (SOLMS-LAUBACH II., GOEBEL I., p. 435). Accordingly in every cross section of a region in or near the place where a flower-peduncle stands, we shall invariably find in the bast a number (30-50) of rounded points, each distinct and remote, or sometimes coming into contact and uniting, every one of which is a cross section of a horizontal thread, arranged in a ring or two all round the xylem. Each of these points throws a perpendicular thread through the cambium layer and xylem, along a medullary ray towards the center. The surface view of the network of horizontal threads in the bast is clearly and easily observable with the naked eye in the process of removing the outer parts of the secondary bast. Therefore, the intramatrical tissue in the bast forms a cylinder-like body made of reticulated threads, which completely surrounds the xylem outside the cambium layer. It is justly comparable in some respects to that of *Cytinus* which lies in the bast as a true, perfect, but unreticulated cylinder inside the cambium layer. The thallus of *Mitrastemon* bears even more resemblance to that of *Burgmannia* (SOLMS-LAUBACH, IV.) and *Pyrostylis* (SOLMS-LAUBACH II., LOTSY p. 882). Such a structure of the intramatrical tissue is considered, at the present time, to be a character peculiar to the Rafflesiaceæ and never observed in any other family. The only connection of this tissue to one of another kind which we call a "senker," is to be found in *Arceuthobium Oxycauli*, a plant belonging to the Loranthaceæ (GOEBEL II., p. 379). The perpendicular threads are by no means terete like the horizontal, but are laterally compressed. Accordingly in the cross section of a vertical thread, which is obtainable in a tangential section of the host-root, it comes into view as a lenticular group of cells always laying side by side with a medullary ray, or sometimes laying in a group of bast cells. It is broader and thicker towards the base (i. e. the bast), but narrower and thinner towards the center of the xylem, and at last becomes a thread consisting towards the apex of a single row of cells.

Therefore, in a longitudinal section of the host-root, and also in a cross section of the same, the vertical threads always appear in the shape of an

elongated wedge with a long thread at the apex. The thread which lies deep within the xylem, after having finished its physiological function, is found dead and buried deep in the xylem. The vertical threads are composed only of rounded parenchymatous cells which are rounded at the basal portions but by and by become elongate towards the apex, especially in the apical portions which are composed of a single row of cells.

The horizontal threads become more and more slender as they recede from the flower-region, and show no more differentiation of peripheral parenchymatous and central tracheidal tissue, and in much remoter regions, say 20 or 30 cm. from the flower-regions and in the part of the root where it attains nearly 2 mm. in diameter (in main or adventive roots), they remain as threads composed each of a single row of cells in or just above the cambium-layer. This shows how widely they are spread over the host root. They are by no means straight, but always anastomosing and running in a zig-zag manner. In longitudinal sections of the host-root, they appear, not as straight lines, but as interrupted or dotted lines. The vertical threads are usually larger in parts near the floral polster, but become shorter in remoter regions. As the horizontal threads reticulate themselves, so do the vertical threads in the region of the xylem, mostly at their apical portions towards the center of the pith. There the vertical threads push out formless branches towards the apex of the host-root, along its long axis, parallel to the horizontal threads in the bast. Here we have another kind of horizontal threads which connect the vertical threads in the xylem, making an irregular network. This network is composed of irregular threads composed of single rows of rounded cells which are very much larger than those in other parts of the intramatrical tissue, and are of very irregular amoeboid shape. The vertical threads which run usually side by side with the medullary rays are easily distinguished from their companions by their having elongated rounded cells full of plasmas, with much larger nuclei, and smooth and much thinner walls. The cells of the medullary rays, in contrast to those of the vertical threads, are usually rectangular, and have pitted and thicker walls. The intramatrical tissue is generally distinguished from the host tissue by its taking a much deeper stain with any staining matter, for example with

DELAFIELD's Hematoxylin solution.

While the horizontal threads in the bast sends inwards, in cross section of the host-root, one vertical thread towards the center, they push outwards two or three short branches towards the bark; but they seem to have no important function, not even of absorption.

In cross sections of a remoter part towards the host-apex, i.e. a region where the root is nearly 3-5 mm. in diameter, we find a thallus consisting of single-rowed cells near or in the cambium-layer. The cells, the outer-most one especially, of the thallus of this region are, in almost all cases, comparatively large, and each, the outermost one especially, contains 2-4 or sometimes as many as eight nuclei. The nuclei are at one time round and at another dumb-bell-shaped, sometimes curved, fusiform or elongated, and the nuclei in the same cell are of very different sizes, some being small, others quite large. They are, in my opinion, as considered from their being very variable in shape and size, and from the position of their cells, possibly formed, not by indirect, but by direct division. The nuclei just mentioned are nearly of the same shape, as those formed by amitose in the cells of *Characeæ*, *Tradescantia* (STRASBURGER I., p. 77, II., pp. 24-45), and in those of a root-bulbulus infected with a kind of mycorrhiza (SHIBATA, p. 644-672). Here, in the present case, the nuclei take, it seems to me, at first a very irregular amoeboid shape, then curve and fold, at last contract at the middle, and divide into two. I have also observed a case where two nuclei thus formed seemed to have come into contact and probably to have united again. Whether nuclei thus divided by amitose division have the ability to divide mitosely or whether they have that ability then first when their union is accomplished, I am not in a position to decide, nor does that question come within the purpose of the present paper. It is quite probable, however, that this amitose division has been caused by the supply of two much nourishment, just as is seen in the cells of endosperma and those of a root-bulbulus infected with a kind of mycorrhiza (STRASBURGER I. c., SHIBATA I. c.).

On comparing the tissue of the infected host-roots with that of uninfected, we find that the secondary bast of the former is usually extremely swollen, and there is no considerable amount of lamellæ of depressed sieve

tubes caused by so-called "obliteration" (TSCHIRCH p. 345); while the secondary bast of the latter is not at all swollen, and there is present a considerable amount of the depressed lamellæ of sieve tubes. We also find here that the swelling of the bast-tissue is especially large in the floral polster. This is possibly ascribable to the same cause as that to which we ascribe the similar effect in the case of galls (KERNER p. 472) and mycorrhiza (SHIBATA l. c.)

The intramatrical tissue, when fully grown, produces endogeneously a flower-bud, which breaks up the bark of the host-root, and protrudes upwards a peduncle, just as in the case of a plant of the Rafflesiaceæ. (SOLMS-LAUBACH I., p. 3; II., IV., LOTSY p. 833).

2. Structure of the Peduncle.

The peduncle of *Mitrastemon*, as is usually the case with a parasite, is extremely primitive in its anatomical structure. The tissue is formed by nearly round parenchymatous cells which are largest towards the center of the tissue mass and become gradually smaller towards the epiderm. Inter-cellular spaces are greater towards the center and smaller towards the periphery, and there are practically none at all outside of the ring of vascular bundles. The epiderm has no stoma. There are 5-10 horse-shoe shaped or semi-circular, outward-curving, vascular bundles around the central pith. They are scattering when few in number, but come into close contact, when there are many of them. Towards the epiderm on the outside of this broken ring of vascular bundles, there are sometimes seen a very few small bundles which seem to run into scales on the peduncles. There is generally in the center of a bundle, in cross section, a group of a few spiral tracheids arranged in a curved line, which is almost completely surrounded by layers of plasmatic cells. The layer of plasmatic cells is thicker on the outer side of the tracheidal bundles, than on the inner side. The cambium-layers, or rather a few cambium-cells, are found just outside of, and close to, the tracheidal-groups. The tracheidal cells here represent a primitive xylem, and the surrounding plasmatic cells an as yet undifferentiated bast. I found,

in a very few cases, very primitive ducts, annular or spiral, within the tracheidal group. I could not discover any true well-formed ducts. Neither sieve-tubes, nor companion cells, nor bast fibres, nor wood-fibres are found anywhere. There are one or two collenchymatous rather rounded rectangular cells near the bundles. The whole tissue like the host itself contains a considerable amount of tannin. The structure of the peduncles is, upon the whole, quite similar to that of *Cytinus*, differing from it only in that it lacks well-formed pitted or annular ducts.

IV. Systematic Position of *Mitrastemon*.

As is stated above, *Mitrastemon* bears a close affinity to plants at present referred to the Rafflesiaceæ and especially to those of the Apodanthæ, a tribe of the same family. It also resembles in some respects the Nepenthaceæ, Hydonoraceæ, Aristolochiaceæ and Balanophoraceæ (MAKINO II., p. 253). It comes near the Nepenthaceæ (WUNSCHMANN) in having single perianth and superior ovary; but greatly differs from it in having peculiar parasitic organs, united stamens, one-celled ovary with many parietal placentas and gamophyllous perianth. It resembles the Hydonoraceæ (SOLMS-LAUBACH V.) in its parasitism, its leafless, one-flowered-peduncles, but differs in having united stamens, one-celled ovary with many parietal placentas and berry-form fruit. Its affinity to the Aristolochiaceæ (SOLEREDER) is to be seen in the gamophyllous perianth, one-celled ovary, berry-form fruit and short columnar styles; but it is quite distinct in its parasitism, leafless peduncles and united stamens. It somewhat resembles the Balanophoraceæ (ENGLER) in having a parasitic habit, and scaly leafless flower-stalk; but the difference in floral structure is so great that it hardly needs pointing out.

As we have seen in external as well as the internal morphological characters, *Mitrastemon* has a close relation to the Rafflesiaceæ, in its absorption-organ, uniflowered leafless peduncles, tetramerous perianth, one-celled ovary with parietal placentas, short columnar style and stigma, and in the structure of its ovules. The only points which formerly led us to

hesitate to refer this plant to the Rafflesiacae, are its having an entirely superior ovary and mitraformed united stamens (HAYATA I., p. 112; MAKINO II., p. 253). As to the difference of the staminal structure, however, the connection of *Mitrastemon* with rafflesiacaceous plants is to be found in the stamens of *Pilostylis* (SOLMS-LAUBACH I., p. 13; LOTSY p. 881) where the one-celled anther-cells are arranged in a few series around the stigmatic disc, and in those of *Mitrastemon* where one-celled anthers are arranged in many series and in an irregular way on a staminal tube covering the style and stigma. Regarding the difference of the position of the ovaries, the relation is also to be found in *Apodanthes* which sometimes has a semisuperior ovary (BENTHAM et HOOKER III., p. 118). Moreover, the position of the ovary cannot by itself to be considered as a sufficiently reliable character to determine the systematic position of a family. As we see in many families in every division of phanerogamous plants, many cases occur in which plants having a superior ovary and others having an inferior ovary are included in one and the same family, and there are even cases in which plants having ovaries which are both superior and inferior are included in one and the same genus, as we see in *Asarum*, a genus of the Aristolochiaceæ. Among gamopetalous plants (BENTHAM et HOOKER II.), the following families are mentioned as those which include plants with superior and inferior ovaries:—Apocynaceæ, Campanulaceæ, Goode-niaceæ, Myrsinæ, Primulaceæ, Compositæ and Styracaceæ. Among Polypetalæ (BENTHAM et HOOKER I.): Bruniaceæ, Celastrineæ, Ficoideæ, Hamamelidaceæ, Holoragaceæ, Melastomaceæ, Myrtaceæ, Olacinaeæ, Portulacaceæ, Rhamnaceæ, Rhizophoraceæ, Rosaceæ, Samydaceæ, Saxifragaceæ and Connaraceæ. Among Monochlamydeæ, (BENTHAM et HOOKER III.):—Balanophoræ, Chenopodiaceæ, Cupuliferæ, Lauraceæ, Monimiaceæ and Santalaceæ. Among Monocotyledones (BENTHAM et HOOKER III.): Bromeliaceæ and Liliaceæ.

As we have stated above, *Mitrastemon* is closely related to the Rafflesiacæ in several points, and even the points which led us previously to regard it as different from the Rafflesiacæ (HAYATA I. p. 112; MAKINO II. p. 252) do not present sufficient characters to warrant the erection of a

special family for the plant. I am, therefore, at present, strongly inclined to refer this plant to the Rafflesiaceæ. In so doing, however, it is necessary to broaden the definition formerly given to the Rafflesiaceæ (SOLMS-LAUBACH I., p. 1; ENGLER-GRILG, p. 176) so far as to note that the family rarely has a superior ovary, or mitriformed united stamens.

That being done, the question arises, to what tribe of the same family should *Mitrastemon* be referred. There are, at present, three tribes, i.e. Rafflesieæ, Apodantheæ, Cytinieæ (SOLMS-LAUBACH I.). The present plant comes nearest to Apodantheæ in the shape of its perianth, ovary and stigma, but differs in having mitriformed united stamens and an entirely superior ovary. After considering the extent of the differences which separate above mentioned three tribes from one another and the points in which this plant differs from all the tribes at present known, I am driven to the conviction that it would be better to make a special tribe for it, as was once suggested by T. MAKINO, and to place it next to Apodantheæ. It is to be granted that one might refer this plant to the Apodantheæ (SOLMS-LAUBACH I., p. 8 and 12) by greatly changing the definition of that tribe. The difference between this plant and Apodantheæ is, however, sufficiently great to make it not unworthy of a special tribe of its own.

The relation of this newly established tribe to the other three, is shown below. Here, so far as is possible, I have followed SOLM's system as to the arrangement and definition of the tribes (SOLMS-LAUBACH I., p. 8.).

A. Germen floris feminei et hermaphroditi irregulariter lacunosum inferius, ovulis ad lacunarum parietes numerosis hemianatropis, integumento unico. Columna apice dilatata antheras infra marginem gerens. Tribus I. Rafflesieæ.

B. Germen floris feminei uniloculare, placentatione parietali. inferius vel superius.

α Ovula ad parietem germinis sessilia stipitata anatropa, integumentis binis instructa. Antheræ bi-tri-verticillatæ, poro apicali transverse dehiscentes; germen inferius.

Tribus II. Apodantheæ.

β Ovula ad parietem germinis plus minus stipitata, anatropa, integumento unico instructa. Antheræ connatæ multiseriatæ mitram formantes. Germen superius.

Tribus III. *Mitrastemoneæ*.

γ Ovula placentis prominentibus varie divisis insidentia, atropa, integumento unico prædita. Germen inferius.

Tribus IV. *Cytineæ*.

V. Resumé.

Mitrastemon has a close affinity to the Rafflesiaceæ in its external as well as its internal morphology. It differs from the same family in its having an entirely superior ovary and mitraform united stamens. These differences are not such as differentiate families, but are rather tribal or generic. To refer the plant to the family named, it is necessary to extend the definition formerly given to it to such an extent as to recognise that it has usually an inferior ovary but sometimes a superior ovary and mitraform united stamens. The points differentiating this plant from the three tribes we have at present in this family, are sufficiently great to make it not unworthy of having a special tribe established for it. The new tribe *Mitrastemoneæ* should be placed next to *Apodantheæ*.

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		" <i>chamedryoides</i> WRIGHT...	148

<i>Tabernae montana</i> LINN.	151	<i>Vaccinium bracteatum</i> THUNB.	125
" <i>dichotoma</i> ROXB.	151	" <i>bracteatum</i> THUNB. var. <i>longi-</i>	
<i>Ternstroemiaceæ</i>	42	" <i>tubum</i> HAYATA.	126
<i>Tetradenia</i> NEES.	166	" <i>caudatifolium</i> HAYATA.	127
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" <i>micrandrum</i> HAYATA.	4	" <i>brachycentra</i>	25
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" <i>sessile</i> HAYATA.	5	" <i>formosana</i> HAYATA.	24
<i>Thea</i> LINN.	44	" <i>hypoleuca</i> HAYATA.	26
" <i>gnaphalocarpa</i> HAYATA.	44	" <i>japonica</i> LANGSD.	24
" <i>lutchuensis</i> ITO.	46	" Kawakamii.	27
" <i>parvifolia</i> HAYATA.	45	" <i>kosanensis</i> HAYATA.	28
" <i>Sasanqua</i> MIQ.	45	" <i>longistipulata</i> HAYATA.	29
<i>Tiliaceæ</i>	47	" <i>Nagasawai</i> HAYATA.	24
<i>Triumfetta</i> LINN.	47	" <i>Patrinii</i> DC.	24
" <i>semitriloba</i> LINN.	47	" Kawakamii HAYATA var. <i>stenope-</i>	
<i>Ulmus</i> LINN.	174	<i>tala</i> HAYATA.	27
" <i>custaneifolia</i> HEMSL.	175	" <i>sylvestris</i> KIT.	30
" <i>Uyematsui</i> HAYATA.	174	" <i>thrichopoda</i> HAYATA.	29
<i>Uraria</i> DESV.	70	" <i>verecundia</i> A. GRAY.	24
" <i>hamosa</i>	71	<i>Vitis</i> LINN.	63
" <i>logopoides</i> DC.	71	" <i>corniculata</i>	63
" <i>latisepala</i> HAYATA.	70	" <i>japonica</i>	63
" <i>picta</i> DESV.	71	" <i>leucocarpa</i> HAYATA.	63
<i>Urticacæ</i>	174	" <i>umbellata</i> HEMSL var. <i>arisanensis</i>	
<i>Uvaria</i> LINN.	10	HAYATA.	63
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" <i>dolichoclada</i> HAYATA.	10	" <i>ovalifolium</i>	49
" <i>obovatifolia</i> HAYATA.	11	" <i>piperitum</i> DC.	50
" <i>purpurea</i> BLUME.	11	" <i>pistaciiflorum</i> HAYATA. . .	49
" <i>purpurea</i> BLUME.	11	" <i>pteropodium</i> HAYATA. . .	49
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ICONES PLANTARUM FORMOSANARUM.

III.

PLATE I.

Explanation of Pl. I.

Thadictrum micranthum HAYATA.

Fig. 1. The plant.
2. A leaf.
3. A flower.
4. A petal.
5. Stamens, front and lateral views.
6. Fruits.
7. Achenes, seen from different sides.
8. A seed.
9. Cross section of the same.



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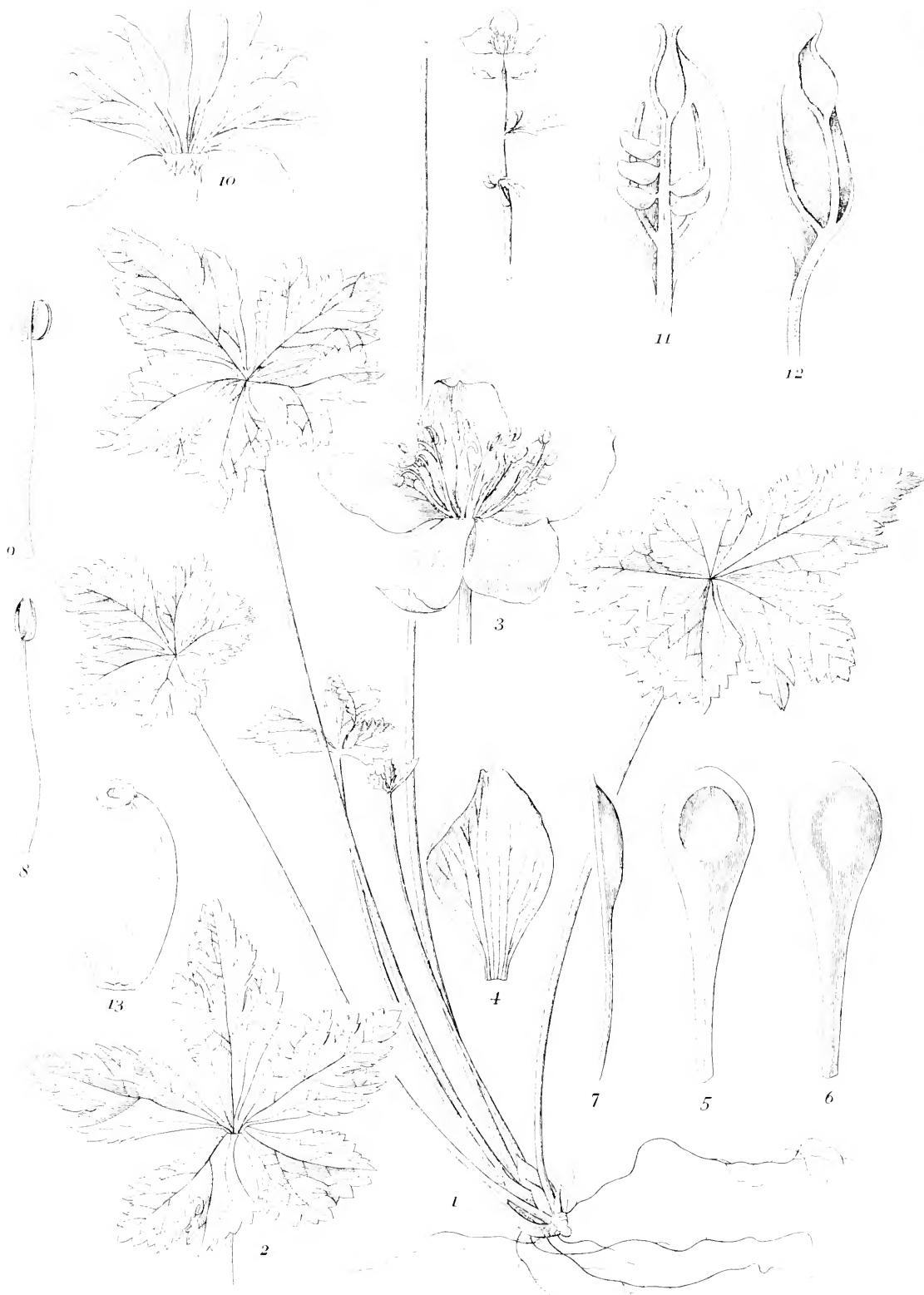
III.

PLATE II.

Explanation of Pl. II.

Coptis Morii HAYATA.

- Fig. 1. The plant.
- 2. A leaf.
- 3. A flower.
- 4. A sepal.
- 5. 6. 7. A petal, seen from different sides.
- 8. 9. A stamen, seen from different sides.
- 10. Fruits on the receptacle.
- 11. A fruit, expanded.
- 12. The same, not expanded, seen from side.
- 13. A seed.



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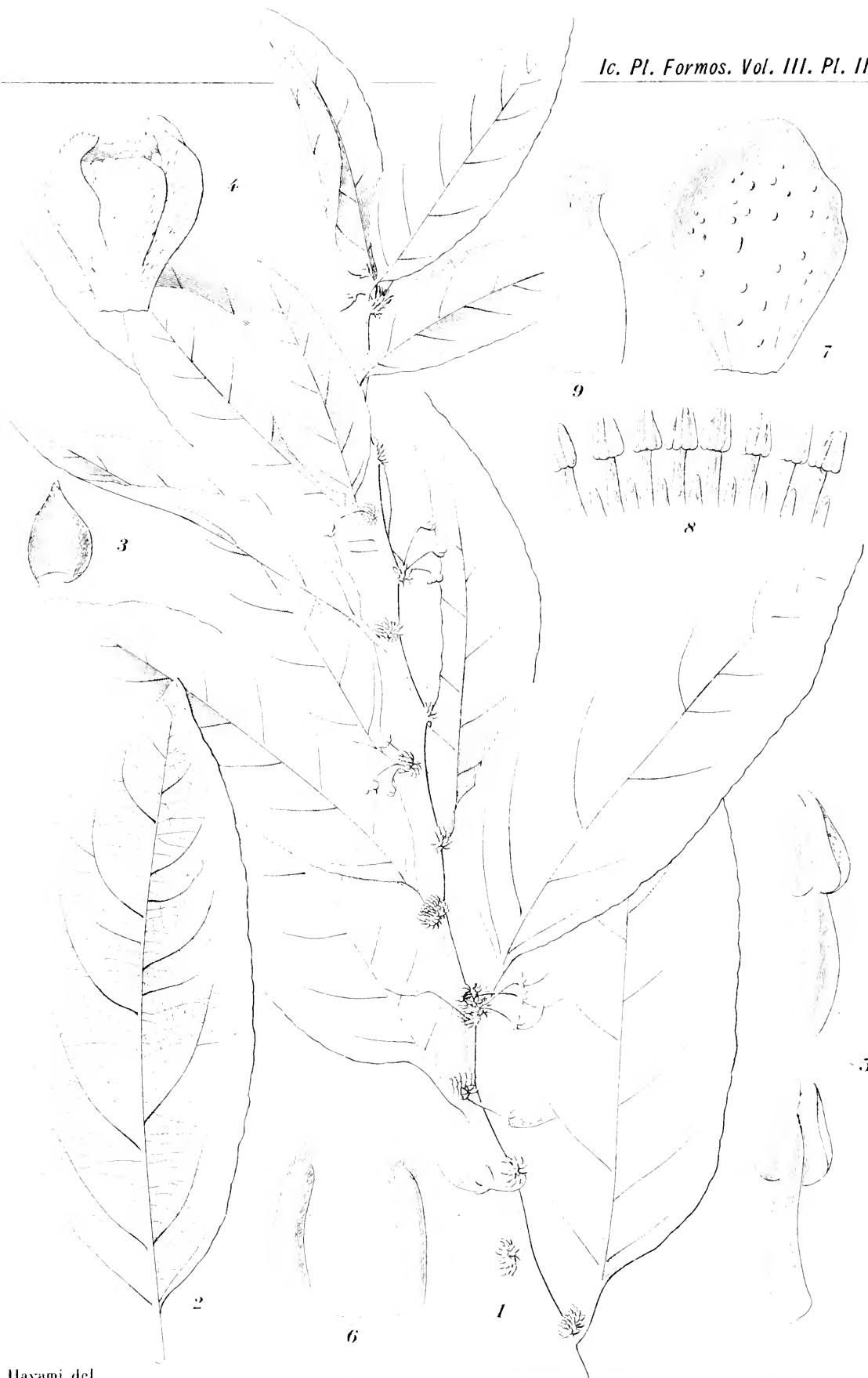
III.

PLATE III.

Explanation of Pl. III.

Cascaria Merrillii HAYATA.

Fig. 1. The plant.
2. A leaf.
3. A bract.
4. A flower.
5. Stamens, seen from different sides.
6. Staminodes.
7. A calyx-lobe.
8. Stamens and staminodes.
9. An ovary.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE IV.

Explanation of Pl. IV.

Garcinia multiflora CHAMP.

Fig. 1. The plant.
2. A leaf.
3. A flower.
4. The same, petals and stamens taken off.
5. A petal.
6. 7. 8. Staminal bundles, seen from different sides.
9. Anther-cells.
10. A stigma of the rudimental ovary.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE V.

Explanation of Pl. V.

Anneslea fragrans WALL. var. *lanceolata* HAYATA.

Fig. 1. The plant.
2. A leaf.
3. A flower.
4. A lower sepal.
5. A marginal portion of the same.
6. Corolla.
7. A flower, corolla and stamens taken off.
8. A petal.
9. Stamens.
10. Vertical section of an ovary.
11. Cross section of the same.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE VI.

Explanation of Pl. VI.

Thea parvifolia HAYATA.

Fig. 1. The plant.
2. Basal portion of a flower, stamens and petals taken off.
3. A bract.
4. A sepal.
5. An inner sepal.
6. Corolla expanded.
7. 8. Stamens, seen from different sides.
9. An ovary in vertical section.
10. Apical portion of a style.



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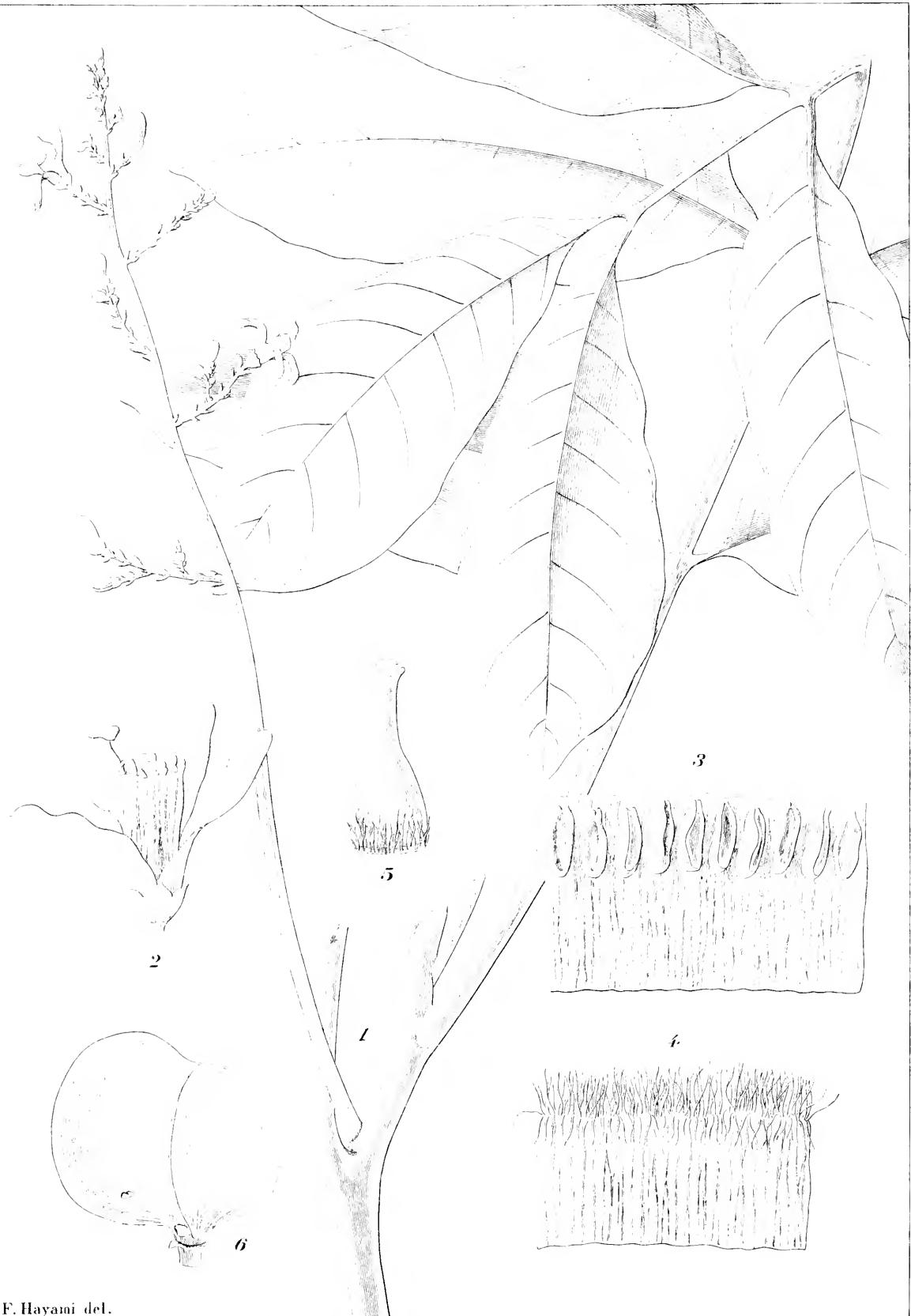
III.

PLATE VII.

Explanation of Pl. VII.

Chisocheton kusukusense HAYATA.

- Fig. 1. A branch.
- 2. A flower.
- 3. Staminal tube, expanded.
- 4. Disc-tube, expanded.
- 5. An ovary.
- 6. A fruit.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE VIII.

Explanation of Pl. VIII.

Ilex lonicerifolia HAYATA.

- Fig. 1. A branch.
- 2. Corolla, expanded.
- 3. A stamen.
- 4. The same, seen from another side.
- 5. A flower, corolla taken off.
- 6. The same, in vertical section.
- 7. Cross section of an ovary.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE IX.

Explanation of Pl. IX.

Ilex micrococca var. *longifolia* HAYATA.

Fig. 1. A branch.
2. Portion of inflorescence.
3. A fruit.
4. The same, seen from below.
5. Cross section of the same.
6. 7. Seeds, seen from different sides.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE X.

Explanation of Pl. X.

Euonymus pellucidifolius HAYATA.

Fig. 1. A branch.
2. A leaf.
3. A flower.
4. The same, seen from below.
5. The same, in vertical section.
6. A petal.
7. 8. Stamens, seen from different sides.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE XI.

Explanation of Pl. XI.

Cassine illiciifolia HAYATA.

Fig. 1. A branch.
2. A leaf.
3. A flower.
4. A bract.
5. A sepal.
6. Corolla, expanded.
7. A petal.
8. 9. 10. 11. 12. Stamens, seen from different sides.
13. An ovary (rudimentary).
14. Cross section of the same.



ICONES PLANTARUM FORMOSANARUM.

III.

47

PLATE. XII.

Explanation of Pl. XII.

Cissus pteroclada HAYATA.

- Fig. 1. The plant.
- 2. Cross section of the stem.
- 3. Part of inflorescence.
- 4. A flower, two petals are taken off to show the stamens and pistil.
- 5. Petals.
- 6. 7. 8. Stamens, seen from different sides.
- 9. An ovary.
- 10. Vertical section of the same.
- 11. Cross section of the same.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE XIII.

Explanation of Pl. XIII.

Karolenteria formosana HAYATA.

Fig. 1. A leaf.
2. A leaflet.
3. A fruit.
4. A seed.
5. An embryo.
6. The same, expanded.

5

1

12

3

4

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III.

PLATE XIV.

Explantaion of Pl. XIV.

- A. *Acer cinnamomifolium* HAYATA.
- B. *Acer litseæfolium* HAYATA.
- C. *Acer hypoleucum* HAYATA.

- Fig. 1. A branch of *A. cinnamomifolium*.
- 2. A flower of the same species.
- 3. A branch of *A. litseæfolium*.
- 4. A fruit of the same species.
- 5. A branch of *A. hypoleucum*.
- 6. A fruit of the same species.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE XV.

Explanation of Pl. XV.

Lespedeza pseudomacrocarpa HAYATA.

Fig. 1. A branch.
2. A leaf, one of the leaflets taken off.
3. Petals, stamens and a pistil.
4. Calyx, expanded.
5. A pod.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE XVI.

Explanation of Pl. XVI.

Euchresta Horsfieldii var. *formosana* HAYATA.

Fig. 1. A branch.
2. Petals, stamens and pistil.
3. Apical portion of calyx (expanded).
4. A fruit.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE XVII.

Explanation of Pl. XVII.

Sanguisorba formosana HAYATA.

- Fig. 1. The plant.
- 2. A leaf.
- 3. A leaflet.
- 4. A flower-head.
- 5. A flower.
- 6. A bract.
- 7. A sepal.
- 8. A flower, stamens taken off.
- 9. 10. 11. Stamens, seen from different sides.
- 12. Cross section of an ovary.



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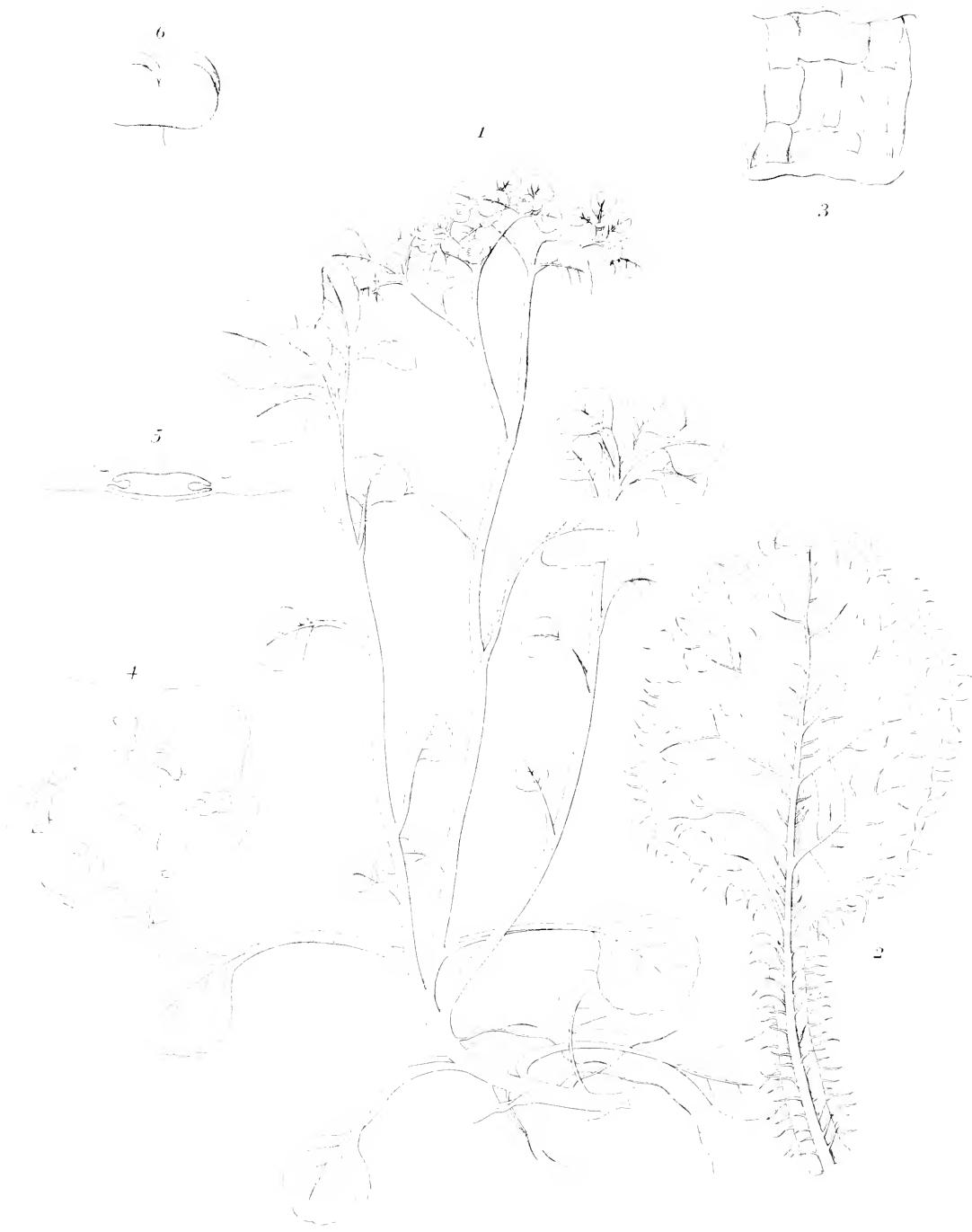
III.

PLATE XVIII.

Explanation of Pl. XVIII.

Chrysosplenium formosanum HAYATA.

Fig. 1. The plant.
2. A leaf.
3. A flower-bud.
4. A flower, expanded.
5. Vertical section of the same.
6. A stamen.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE XIX.

Explanation of Pl. XIX.

Eustigma oblongifolium GORDN. et CHAMP.

Fig. 1. A branch.
2. A leaf.
3. A flower.
4. A bract.
5. A hair on the calyx.
6. A calyx-lobe with a stamen.
7. 8. Petals, seen from different sides.
9. 10. 11. Stamens, seen from different sides.
12. A flower in vertical section.
13. A style.
14. A fruit-bearing raceme.
15. Vertical section of a fruit.
16. 17. Seeds, seen from different sides.



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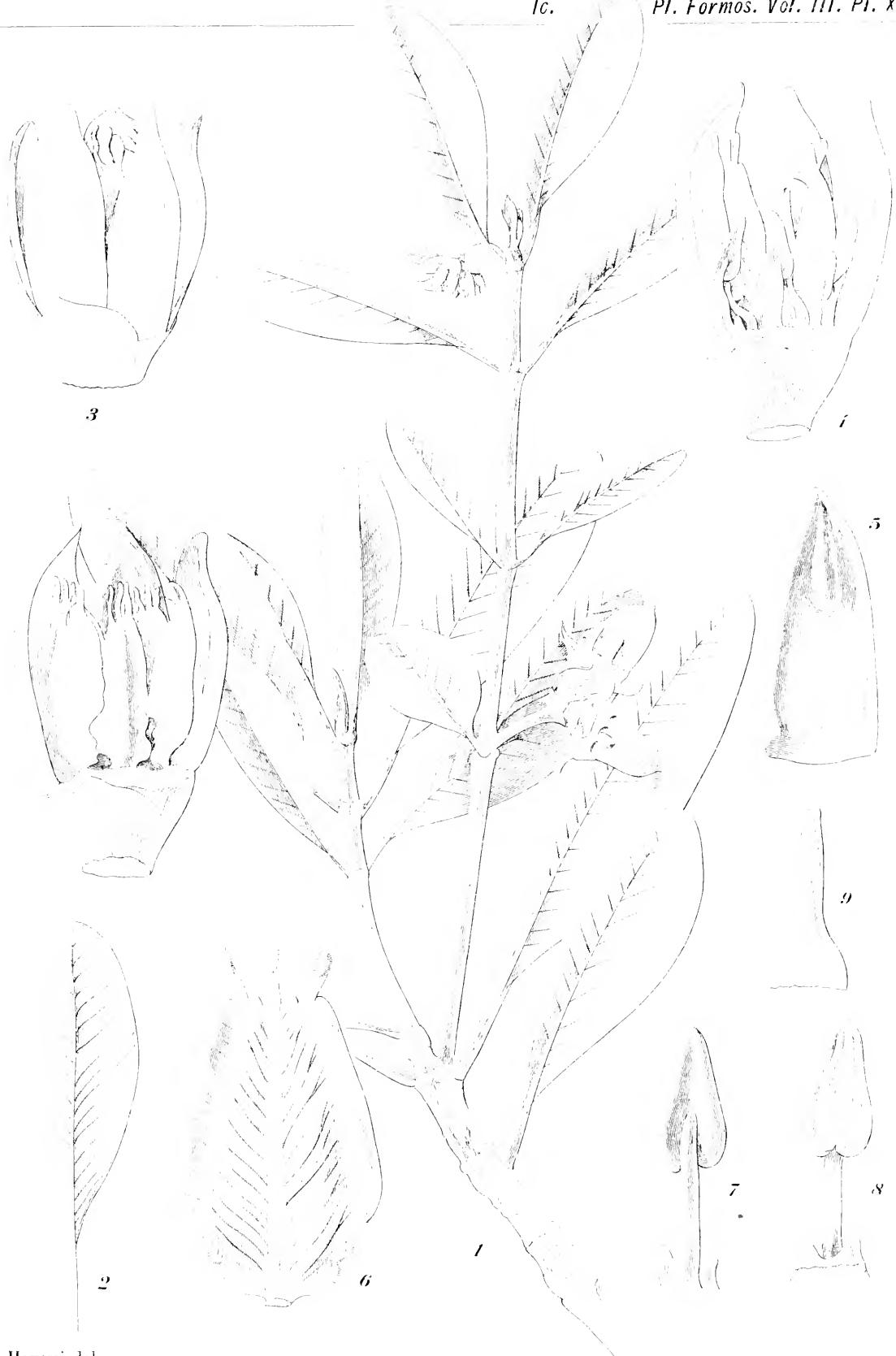
III.

PLATE XX.

Explanation of Pl. XX.

Ceriops Candolleana ARN. var. *Sasakii* HAYATA.

- Fig. 1. A branch.
- 2. A leaf.
- 3. A flower.
- 4. The same, sepals and petals partially taken off; sepals, petals, stamens and a pistil are seen.
- 5. A sepal.
- 6. A petal.
- 7. 8. A stamen, seen from different side.
- 9. A pistil.



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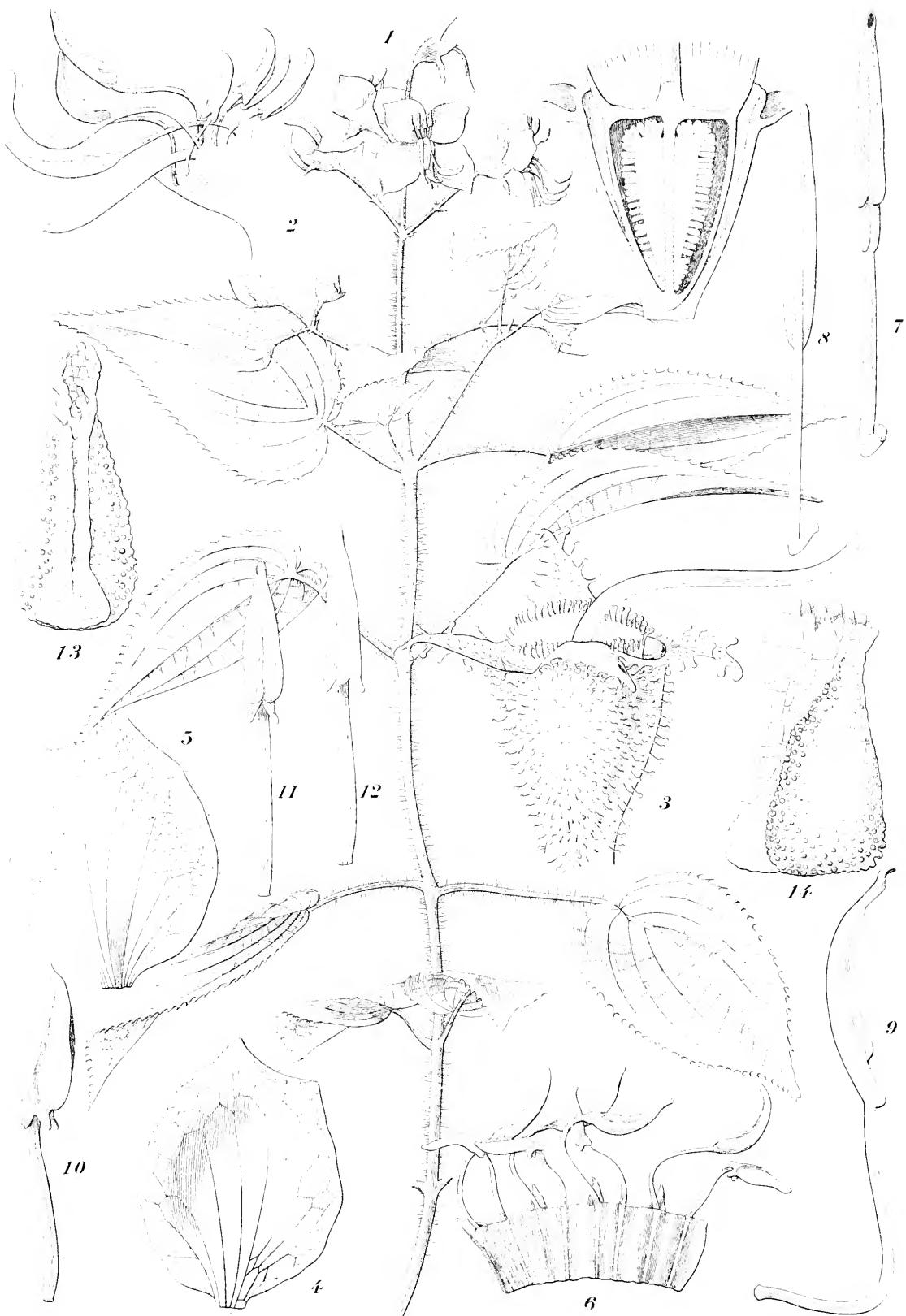
III.

PLATE XXI.

Explanation of Pl. XXI.

Bredia scandens HAYATA.

Fig. 1. The plant.
2. A flower.
3. The same, petals and stamens taken off.
4. A petal, seen from within.
5. The same, seen from without.
6. Calyx, expanded.
7. 8. 9. Stamens of one kind, seen from different sides.
10. 11. 12. Stamens of the other kind, seen from different sides.
13. 14. Seeds, seen from different sides.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE XXII.

Explanation of Pl. XXII.

Vaccinium cudentifolium HAYATA.

- Fig. 1. A branch.
- 2. A leaf.
- 3. A raceme.
- 4. An outer scale of a bud of a raceme.
- 5. A middle scale of the same.
- 6. An inner scale of the same.
- 6a. The inner-most scale of the same.
- 7. A portion of the outer surface of the same, showing glandular hairs.
- 8. Two bracteoles.
- 9. A bract.
- 10. A flower.
- 11. Corolla, expanded.
- 12. Calyx and ovary.
- 13. 14. 15. Stamens, seen from different sides.
- 16. Cross section of an ovary.
- 17. A fruit.
- 18. A seed.
- 19. Albumen.
- 20. Vertical section of the same, showing an embryo.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE XXIII.

Explanation of Pl. XXIII.

Rhododendron caryophyllum HAYATA.

Fig. 1. A branch.
2. A leaf, showing the lower surface, (natural size).
3. The same, showing the upper surface (slightly magnified).
3a. A portion of the under surface of a leaf.
4. A bract.
5. A bracteole.
6. An outer bract.
7. An inner bract.
8. The inner-most bract.
9. Corolla, expanded.
10. 11. 12. Stamens.
13. An ovary.
14. Cross section of the same.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE XXIV.

Explanation of Pl. XXIV.

Rhododendron leiopodium HAYATA.

- Fig. 1. A branch.
- 2. A leaf.
- 3. A flower, expanded.
- 4. 5. 6. 7. Bracts, outer to inner.
- 8. 9. 10. Stamens.
- 11. An ovary.
- 12. Stigma.
- 13. Cross section of an ovary.



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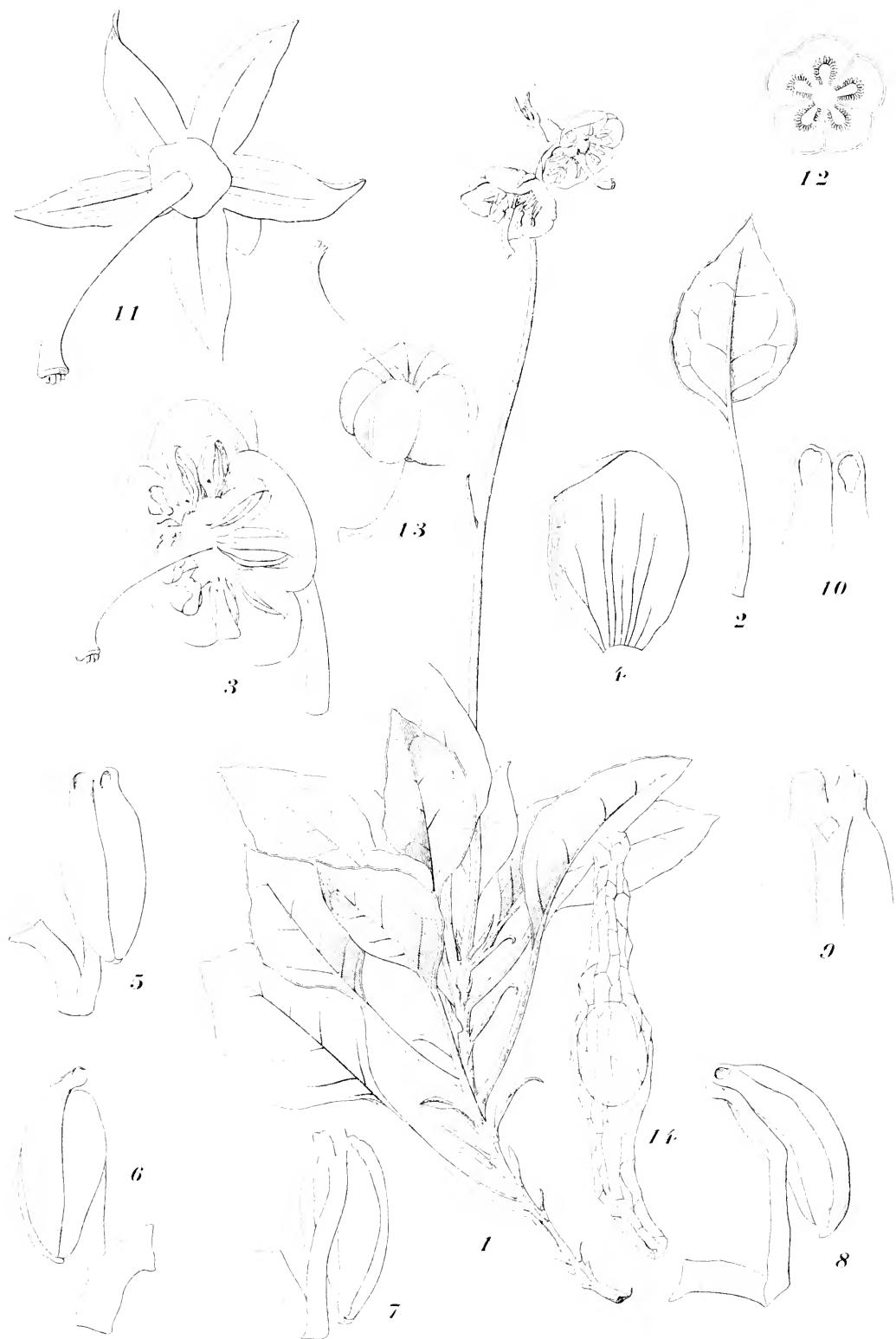
III.

PLATE XXV.

Explanation of Pl. XXV.

Pyrola albo-reticulata HAYATA.

Fig. 1. The plant.
2. A leaf.
3. A flower.
4. A petal.
5. 6. 7. 8. Stamens, seen from different sides.
9. 10. Apical portions of a stamen, seen from different sides.
11. A flower, petals and stamens, taken off.
12. Cross section of an ovary.
13. A fruit.
14. A seed.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE XXVI.

Explanation of Pl. XXVI.

Pyrola morrisonensis HAYATA.

- Fig. 1. The plant.
- 2. A petal.
- 3. A flower, petals and stamens taken off.
- 4. 5. 6. Stamens, seen from different sides.
- 7. Cross section of an ovary.
- 8. Apical portion of a style.
- 9. A fruit.
- 10. A seed.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE XXVII.

Explanation of Pl. XXVII.

Shortia exappendiculata HAYATA.

Fig. 1. The plant.
2. A leaf.
3. A marginal portion of a leaf, seen from below.
4. The same, seen from above.
5. A flower.
6. Corolla, expanded.
7. A stamen.
8. A flower, corolla and stamens taken off.
9. Cross section of an ovary.
10. An ovule.
11. Apical portion of a style, showing the stigma.
12. A fruit.
13. Valves of the same.
14. A valve.
15. 16. Seeds, seen from different sides.
17. Portion of the seed-coat, showing its reticulation.

ICONES PLANTARUM FORMOSANARUM.

III.

PLATE XXVIII.

Explanation of Pl. XXVIII.

Chionanthus serrulatus HAYATA.

Fig. 1. A branch.
2. A leaf.
3. Calyx.
4. A flower.
5. Corolla, expanded.
6. 7. 8. Stamens, seen from different sides; the attaching parts
of the filaments to the corolla are shaded.



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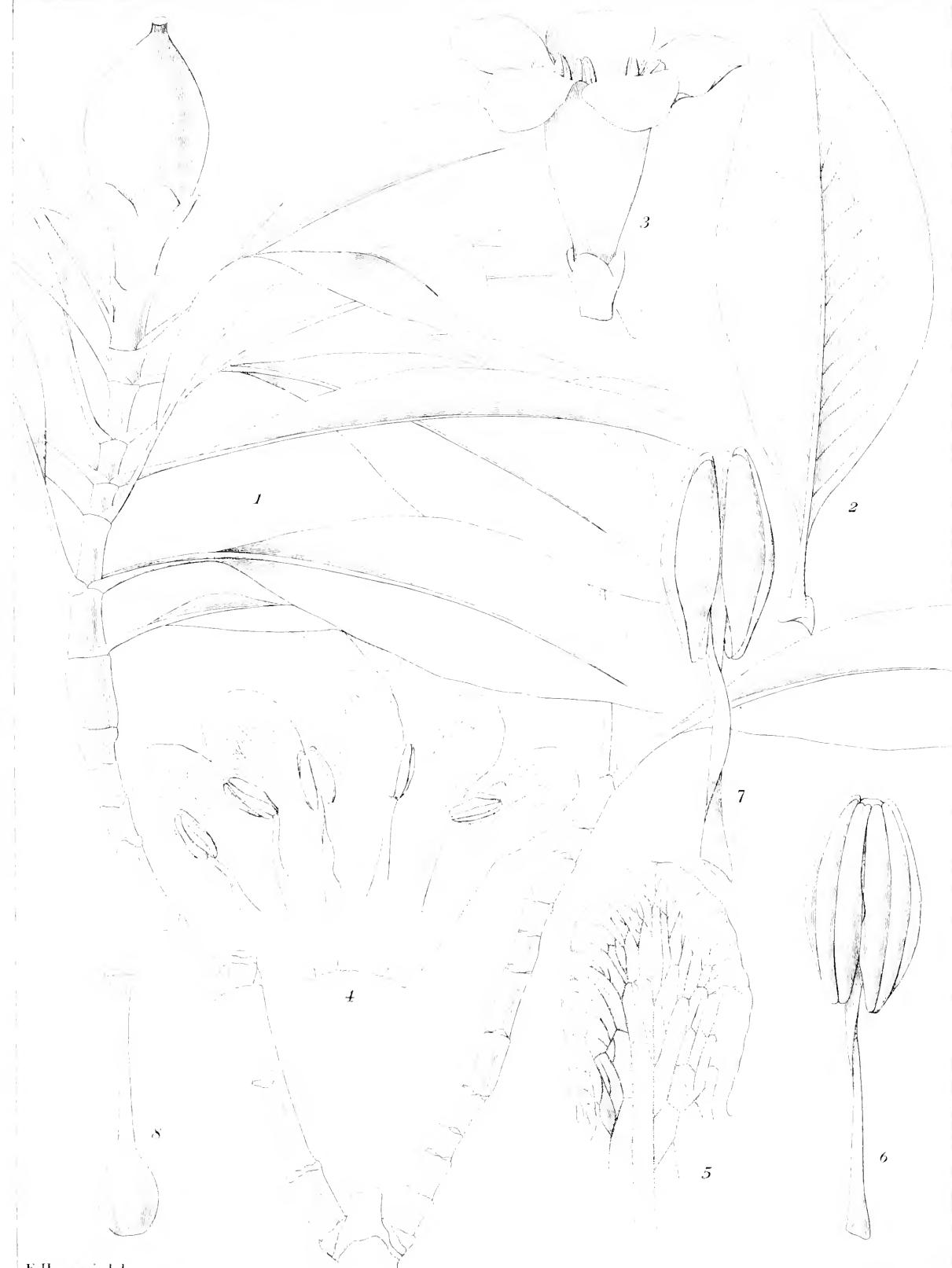
III.

PLATE XXIX.

Explanation of Pl. **XXIX.**

Fagræa Sasakii HAYATA.

Fig. 1. A branch.
2. A leaf.
3. A flower.
4. Corolla, expanded.
5. A corolla-lobe.
6. 7. Stamens, seen from different sides.
8. An ovary.



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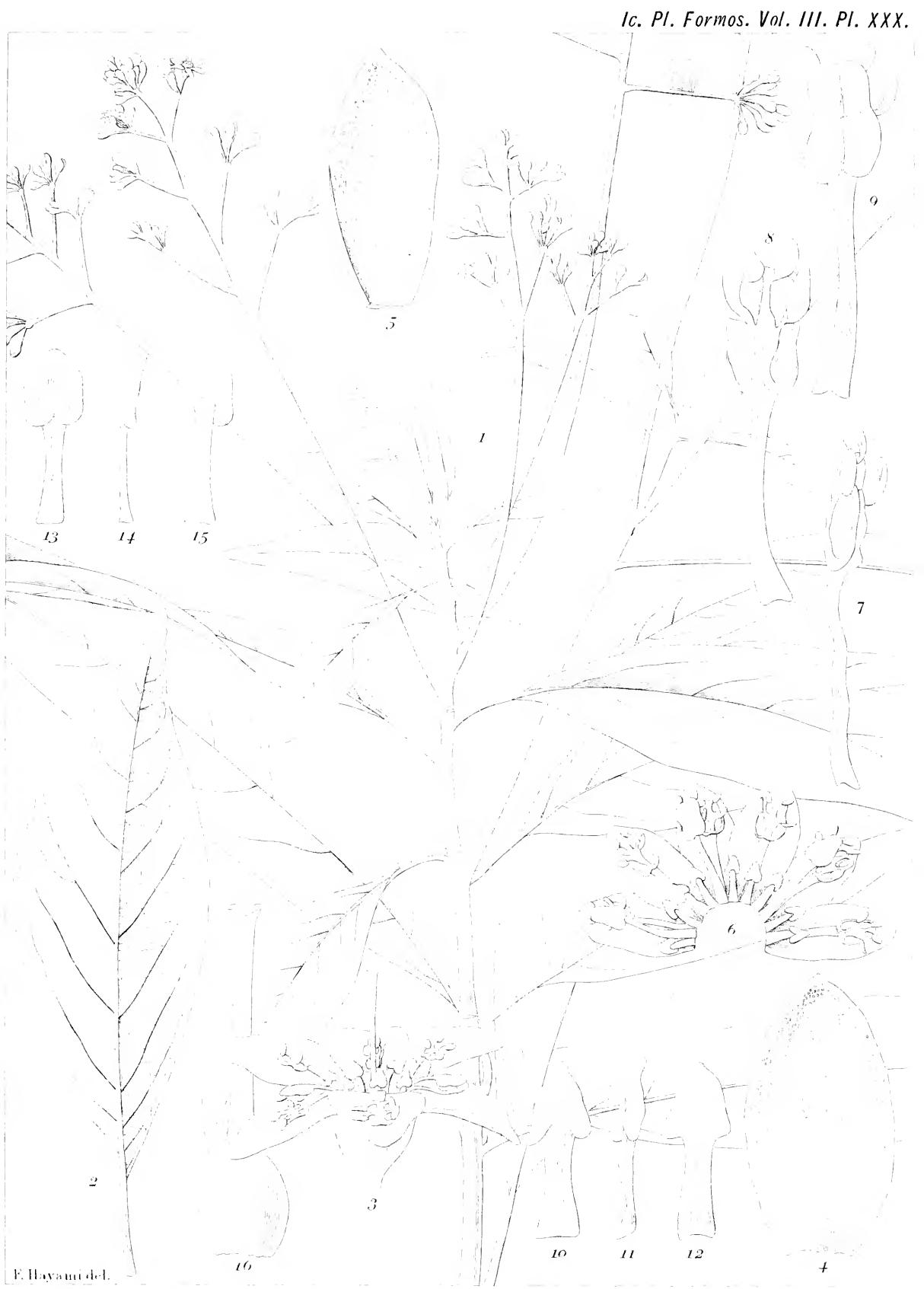
III.

PLATE XXX.

Explanation of Pl. XXX.

Machilus longipaniculata HAYATA.

Fig. 1. A branch.
2. A leaf.
3. A flower.
4. A sepal.
5. An inner sepal.
6. Limb of the calyx, expanded.
7. 8. 9. Stamens of one kind, seen from different sides.
10. 11. 12. Staminodes of one kind.
13. 14. 15. Staminodes of the other kind.



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III.

PLATE XXXI.

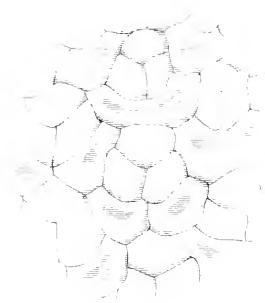
Explanation of Pl. XXXI.

Balanophora mutinoides HAYATA.

Fig. 1. A male plant.
2. Portion of the flower-head, seen from above.
3. A male flower.
4. The same, seen from above.
5. A female plant.
6. A portion of the flower-head.
7. A columella with female flowers at its base.
8. The same in cluster.
9. Cross section of a female flower-head.



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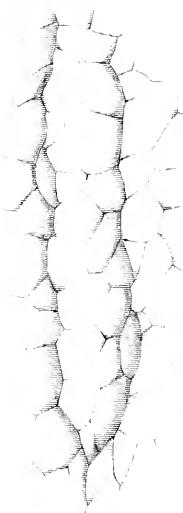
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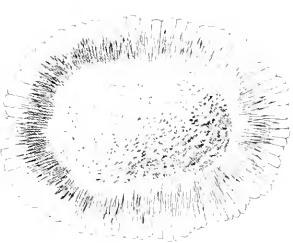
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9



9

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III.

PLATE XXXII.

Explanation of Pl. XXXII.

Ulmus Uyematsui HAYATA.

Fig. 1. A branch.
2. A leaf.
3. Calyx and stamens, expanded.
4. A young fruit.
5. A seed.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE XXXIII.

Explanation of Pl. XXXIII.

A. = *Carpinus minutiserrata* HAYATA.

Fig. 1. A branch.
2. A half of a leaf, showing its under surface.
3. 4. 5. Fruit-bearing bracts seen from different sides, (in 4, a fruit taken off.).
6. A fruit.

B. = *C. Kawakamii* HAYATA.

Fig. 1. A branch.
2. A half of a leaf.
3. 4. 5. Fruit-bearing bracts, seen from different sides, (in 4, a fruit taken off.).
6. A fruit.



ICONES PLANTARUM FORMOSANARUM.

III.

PLATE XXXIV.

Explanation of Pl. XXXIV.

Pinus brevispica HAYATA.

Fig. 1. A branch with flowers and cones.
2. A two-leaved branchlet.
3. Basal portion of the same.
4. A male flower-bud.
5. 6. Bracts of the same.
7. A male flower.
8. 9. 10. Stamens, seen from different sides.
11. A cone.
12. A scale, taken from the middle portion of the cone (n. s.).
13. A winged seed, (n. s.).
14. A scale taken from the middle portion of a cone, (nearly two times).
15. 16. The same, seen from within, one with seeds, the other without seeds.
17. A seed, seen from side, (magnified).



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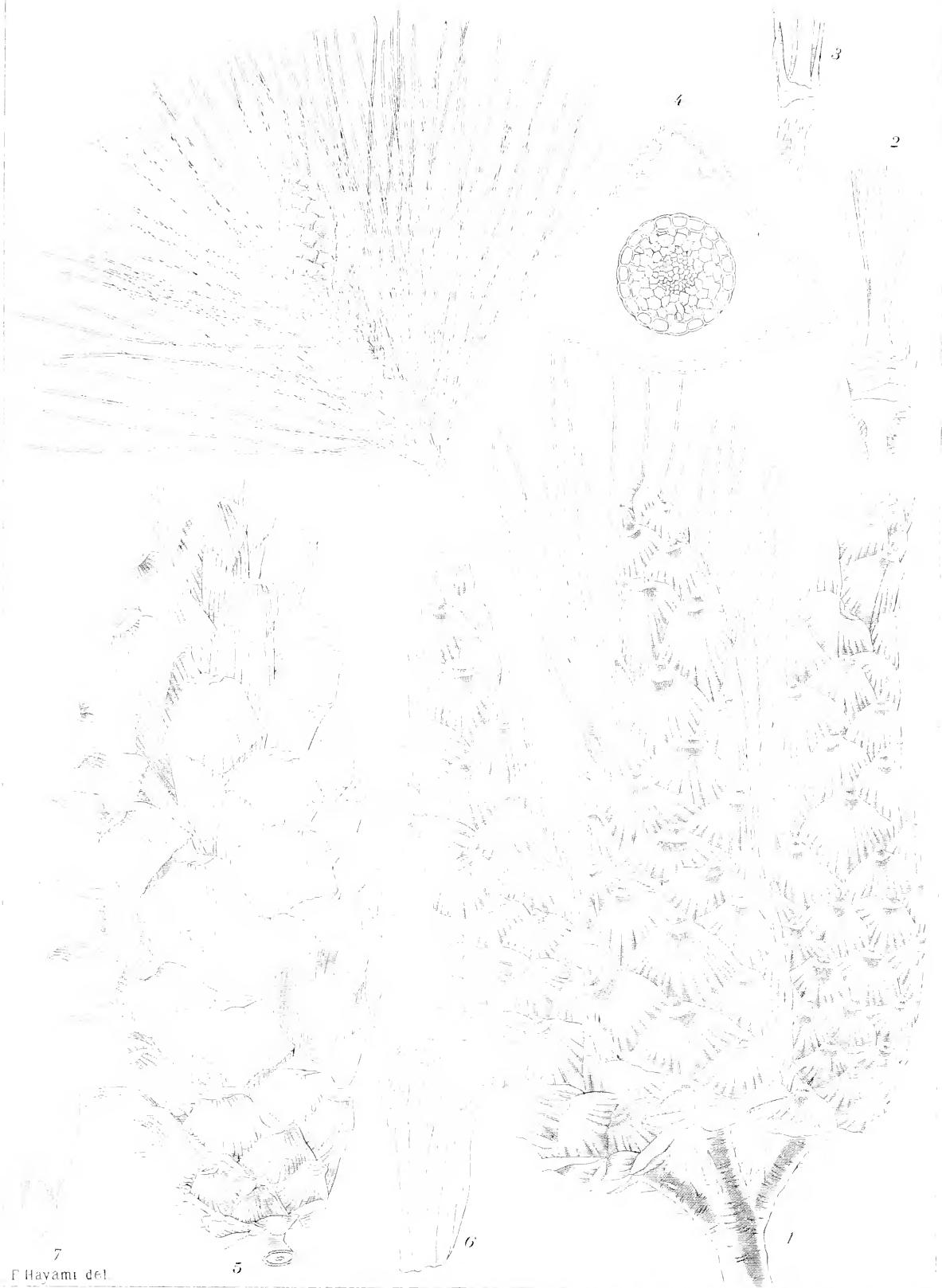
III.

PLATE XXXV.

Explanation of Pl. XXXV.

Pinus Uyematsui ΉΛΥΔΑ.

Fig. 1. A cone-bearing branch.
2. Basal portion of a five leaved branchlet, seen from front.
3. The same, seen from side.
4. Cross section of a leaf.
5. A cone, after dissemination.
6. A scale taken from the middle portion of the cone (n. s.).
7. A seed (n. s.).



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